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GLOBAL DATA MONITORING REPORT

DECEMBER 2000

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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RG12 2SZ

2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison	:Background field from UKMO global model.
Observation times	:00, 06, 12, 18 UTC
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).

Parameters monitored

:NOBS	:Number of observations received excluding duplicates.
:NGE	:Number of observations with gross errors.
:PGE	:Percentage of observations with gross errors.
:SD	:SD of difference of observations from background values excluding those with gross errors.
:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA

:NOBS	≥ 20 , and one or more of the following:	
1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
CG2960	ALL	P	SUR	141	64	45	5.2	10.2	11.5
C6FD9	ALL	P	SUR	38	0	0	0.7	4.2	4.3
DGSR	ALL	P	SUR	33	0	0	1.7	-4.0	4.3
ELGG3	ALL	P	SUR	29	2	7	1.6	4.3	4.6
ELVJ9	ALL	P	SUR	86	1	1	3.4	-4.8	5.9
ELXB8	ALL	P	SUR	30	9	30	2.1	-2.8	3.5
ELXX4	ALL	P	SUR	20	0	0	1.2	-5.6	5.8
KMJL	ALL	P	SUR	40	1	2	0.9	-4.1	4.2
LAFQ5	ALL	P	SUR	38	0	0	1.7	-6.5	6.8
OZBW6	ALL	P	SUR	24	0	0	1.0	-4.3	4.4
OZLB	ALL	P	SUR	28	0	0	1.8	-4.1	4.4
PCAG	ALL	P	SUR	87	0	0	2.7	-8.4	8.9
P3YR5	ALL	P	SUR	51	0	0	2.3	5.2	5.7
P3YS5	ALL	P	SUR	59	0	0	1.8	4.0	4.4
UAIS	ALL	P	SUR	38	0	0	2.6	-6.4	6.9
UAMR	ALL	P	SUR	33	2	6	2.0	-12.4	12.6
UANA	ALL	P	SUR	43	0	0	1.3	-4.1	4.3
UAZX	ALL	P	SUR	26	10	38	1.1	-0.9	1.4
UCUC	ALL	P	SUR	27	27	100			
UDDE	ALL	P	SUR	46	4	9	3.8	4.3	5.8
UDUK	ALL	P	SUR	21	0	0	1.0	5.2	5.3
UFAA	ALL	P	SUR	20	0	0	1.0	7.6	7.7
UFNH	ALL	P	SUR	51	0	0	2.1	-4.9	5.3
VCJM	ALL	P	SUR	32	32	100			
VCPX	ALL	P	SUR	30	1	3	0.8	-4.1	4.2
VCRT	ALL	P	SUR	41	1	2	2.5	-6.4	6.9
VGFQ	ALL	P	SUR	46	15	33	1.7	-3.4	3.8
VOXZ	ALL	P	SUR	23	1	4	2.5	-4.9	5.5
VRVI2	ALL	P	SUR	58	0	0	0.8	6.2	6.3
V7BW9	ALL	P	SUR	37	0	0	2.0	-4.7	5.1
WQZ7049	ALL	P	SUR	61	2	3	1.8	-4.8	5.2
WWXA	ALL	P	SUR	61	0	0	2.6	-5.7	6.3
WXN3191	ALL	P	SUR	41	0	0	1.7	-4.1	4.4
ZCAA2	ALL	P	SUR	24	6	25	4.9	-5.6	7.4
9MCU	ALL	P	SUR	20	0	0	2.4	4.6	5.2
9VRA	ALL	P	SUR	44	0	0	2.6	-5.2	5.8
WIND SPEED									
DGAF	ALL	SPEED	SUR	31	9	29	5.8	3.1	6.6
DIOB	ALL	SPEED	SUR	33	0	0	5.5	5.6	7.8
ELWB8	ALL	SPEED	SUR	28	0	0	6.5	5.7	8.6
ELWZ5	ALL	SPEED	SUR	35	0	0	4.8	7.8	9.2
FNEH	ALL	SPEED	SUR	26	0	0	4.0	5.4	6.8
KGTY	ALL	SPEED	SUR	25	0	0	3.5	5.3	6.4
KJDG	ALL	SPEED	SUR	23	1	4	3.6	5.1	6.3
PJIB	ALL	SPEED	SUR	36	0	0	6.6	5.5	8.6
PJOD	ALL	SPEED	SUR	41	0	0	6.5	6.5	9.2
PJVB	ALL	SPEED	SUR	45	0	0	6.0	6.4	8.7
PPSO	ALL	SPEED	SUR	42	0	0	5.0	7.2	8.8
VCRT	ALL	SPEED	SUR	38	0	0	3.2	5.9	6.7
VLST	ALL	SPEED	SUR	197	0	0	3.1	5.0	5.9
VRWK3	ALL	SPEED	SUR	21	0	0	5.7	5.0	7.5
V2TN	ALL	SPEED	SUR	30	2	7	4.7	5.3	7.1
ZCAO7	ALL	SPEED	SUR	71	0	0	6.0	9.1	10.9
ZCBU8	ALL	SPEED	SUR	50	0	0	3.6	5.9	6.9
3EJB9	ALL	SPEED	SUR	27	0	0	4.9	5.0	7.0
44145	ALL	SPEED	SUR	233	0	0	3.9	5.2	6.5
62108	ALL	SPEED	SUR	137	0	0	2.4	-6.2	6.7
63116	ALL	SPEED	SUR	37	0	0	4.9	-5.4	7.3
WIND DIRECTION									
ZCBJ2	ALL	DIRN.	SUR	23	0	0	36.2	-31.5	48.0
62107	ALL	DIRN.	SUR	611	9	1	39.2	-35.7	53.0

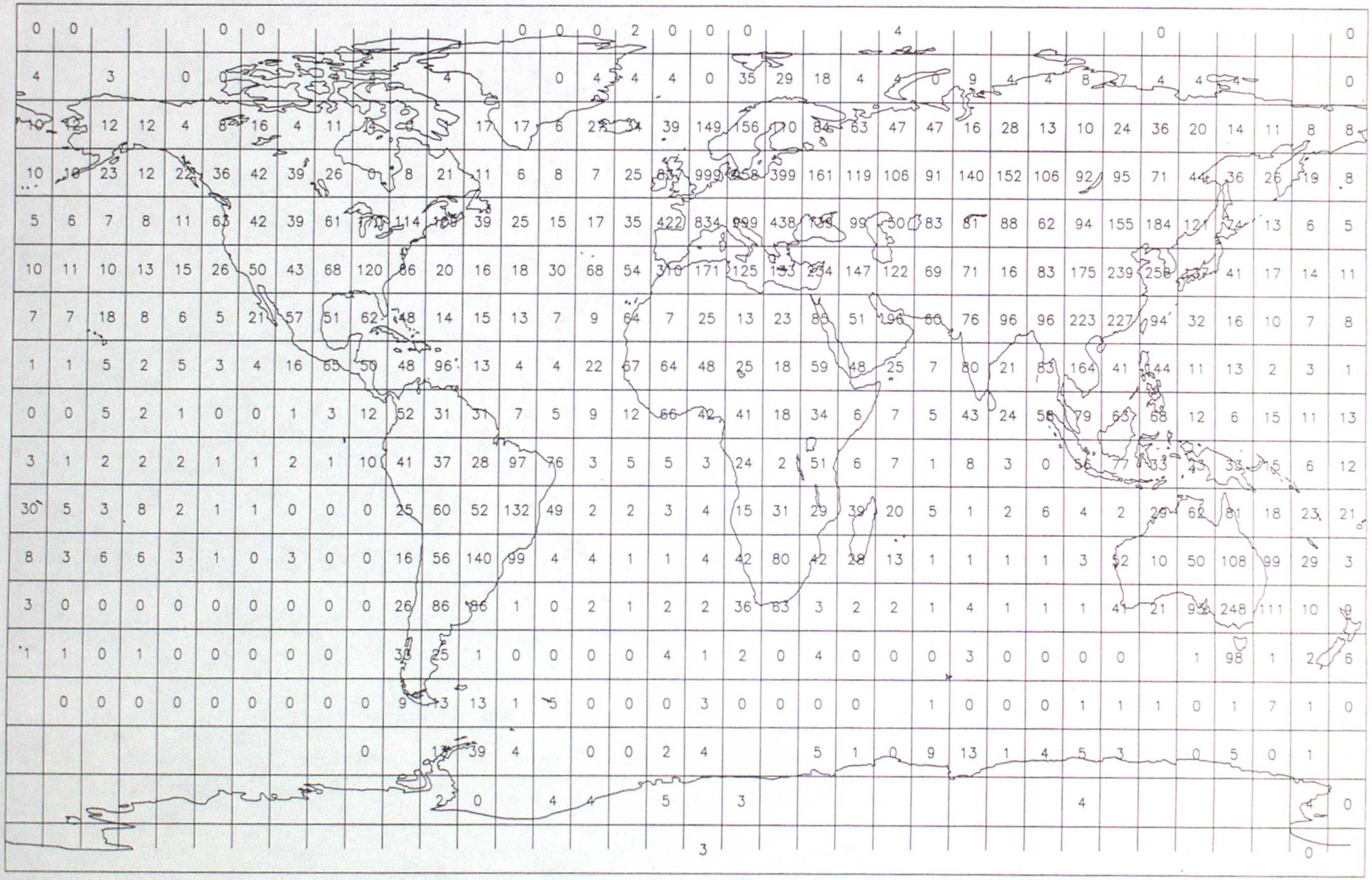
AVAILABILITY – SHIP/SYNOP – DECEMBER 2000

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 21337

FIGURE 1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8 3 6 6 3 1 0 3 0 0 16 56 140 99 4 4 1 1 4 42 80 42 28 13 1 1 1 1 3 52 10 50 108 99 29 3
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0 13 39 4 0 0 2 4 5 1 0 9 13 1 4 5 3 0 5 0 1
2 0 4 4 5 3 4 0
3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
17546	-34.6	69.1	ALL	P	SUR	318	0	0	0.7	-5.7	5.7
17642	-39.4	11.3	ALL	P	SUR	828	5	1	1.5	4.9	5.1
23925	44.7	-63.6	ALL	P	SUR	50	0	0	0.6	-6.0	6.0
23933	13.5	70.7	ALL	P	SUR	243	0	0	0.8	-4.5	4.6
31537	-2.2	-43.0	ALL	P	SUR	207	0	0	4.9	-7.6	9.0
31953	-20.8	-40.7	ALL	P	SUR	832	52	6	2.5	10.1	10.4
33570	-45.0	-52.8	ALL	P	SUR	331	10	3	3.3	5.2	6.1
41524	18.2	-72.1	ALL	P	SUR	42	0	0	1.9	4.6	4.9
46624	52.6	160.1	ALL	P	SUR	248	24	10	8.2	1.2	8.3
64546	49.1	-6.4	ALL	P	SUR	104	82	79	3.4	13.1	13.6
WIND SPEED											
17557	-35.6	83.7	ALL	SPEED	SUR	766	0	0	2.2	-5.7	6.1
41502	24.6	-77.7	ALL	SPEED	SUR	80	0	0	2.8	-5.7	6.3
41590	19.3	-61.2	ALL	SPEED	SUR	522	0	0	2.5	-6.0	6.5
41616	20.5	-51.9	ALL	SPEED	SUR	543	0	0	2.7	-5.3	5.9
46657	53.6	-147.4	ALL	SPEED	SUR	58	0	0	1.7	-6.7	6.9
WIND DIRECTION											
46660	48.1	-140.5	ALL	DIRN.	SUR	200	26	13	115.9	-13.0	116.7

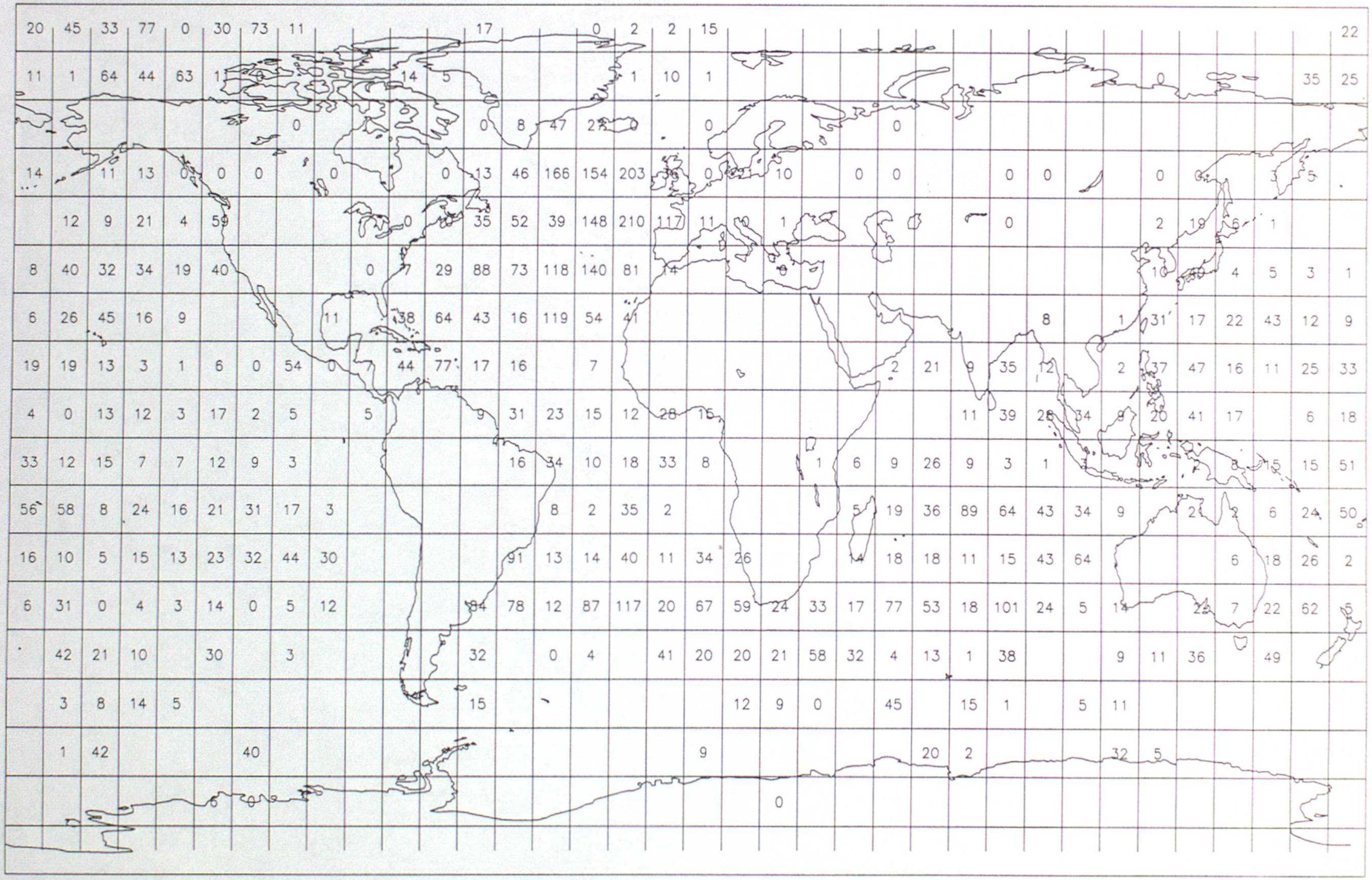
AVAILABILITY – DRIFTER – DECEMBER 2000

FIGURE 2

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 8107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42 21 10 30 3 32 0 4 41 20 20 21 58 32 4 13 1 38 9 11 36 49
3 8 14 5 15 12 9 0 45 15 1 5 11
1 42 40 9 20 2 32 5
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
61816	10.9N	14.3W	69	MS	24	6	25	4	1.1	-2.5	2.7
62056	32.8N	21.8E	625	S8	51	1	2	0	1.0	-5.4	5.5
62271	24.2N	23.3E	417	M	101	0	0	1	1.6	4.6	4.9
62790	12.1N	24.9E	674	MS	83	1	1	2	1.2	4.6	4.8
63602	3.1N	30.9E	1204	S	63	63	100	0			
63680	0.3N	32.6E	1144	S	27	1	4	4	2.0	-8.3	8.5
63801	4.9S	29.6E	882	S8	42	1	2	0	1.0	7.9	8.0
68030	18.5S	25.6E	1071	8	30	0	0	0	1.0	4.1	4.2
68038	20.5S	26.0E	903	8	30	0	0	3	1.2	4.0	4.2
68185	25.1S	30.5E	1434	M	20	16	80	30	1.7	8.2	8.4
68338	26.9S	24.6E	1234	S8	49	46	94	0	2.6	1.1	2.8
68396	26.5S	31.3E	641	S8	49	0	0	0	0.9	4.9	5.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23383	66.9N	93.5E	278	MS	118	0	0	39	3.3	4.5	5.6
24329	66.3N	114.3E	236	MS	122	0	0	11	1.5	4.6	4.8
24671	63.9N	135.9E	402	MS	122	7	6	0	4.6	7.1	8.5
24688	63.3N	143.2E	741	MS	123	18	15	21	5.6	5.2	7.6
30157	58.3N	112.9E	224	MS	122	0	0	4	2.9	4.1	5.0
30253	57.9N	114.2E	275	MS	81	0	0	9	3.5	5.5	6.5
30372	56.9N	118.3E	711	MS	124	7	6	2	5.3	5.2	7.4
30554	54.5N	113.6E	995	MS	124	0	0	0	3.1	7.7	8.3
30664	53.5N	115.6E	811	MS	31	1	3	3	1.2	-4.1	4.3
30669	53.1N	117.5E	708	MS	22	0	0	0	1.2	-5.4	5.5
30967	49.9N	115.8E	623	MS	90	3	3	2	3.2	-8.5	9.1
31123	57.8N	130.9E	255	MS	124	4	3	30	3.5	6.9	7.7
31474	51.6N	133.3E	384	MS	124	2	2	19	3.1	5.0	5.9
36982	41.9N	78.2E	3635	S7	107	0	0	2	0.9	-4.6	4.7
40726	36.8N	45.7E	1384	MS	120	0	0	1	1.2	4.2	4.4
40741	36.6N	61.2E	235	MS	114	0	0	0	1.4	-5.0	5.2
41254	23.1N	57.7E	1755	S8	72	72	100	0			
41314	17.7N	54.0E	467	MS	117	0	0	0	0.8	4.3	4.4
41396	16.0N	48.9E	700	MS	52	1	2	0	0.8	7.5	7.5
41466	13.7N	44.1E	1402	8	52	0	0	0	0.9	-5.5	5.6
41696	29.0N	66.6E	2015	M	43	22	51	0	1.5	-0.9	1.7
44218	48.0N	91.6E	1406	MS	119	1	1	0	1.7	-4.0	4.3
44256	49.6N	114.4E	706	MS	110	0	0	11	2.6	-4.6	5.3
44313	47.6N	118.6E	689	MS	106	2	2	8	1.8	-5.3	5.6
44416	28.6N	81.6E	720	MS	38	2	5	0	1.2	5.5	5.6
47022	40.8N	128.2E	1200	S	81	2	2	5	2.0	4.7	5.1
51334	44.6N	82.9E	321	M	123	0	0	0	2.8	6.5	7.1
51379	44.0N	89.6E	794	M	123	0	0	58	2.0	5.5	5.9
51495	43.5N	91.6E	874	M	124	3	2	0	1.9	12.0	12.1
51818	37.6N	78.3E	1376	M	124	0	0	65	2.9	6.9	7.5
52378	41.4N	102.4E	960	M	122	0	0	10	1.6	4.3	4.6
52602	38.8N	93.4E	2734	S	124	0	0	0	1.2	-5.1	5.2
52866	36.6N	101.8E	2262	S	124	0	0	0	0.9	-4.3	4.4
52955	35.6N	100.8E	3201	S	124	0	0	0	0.7	12.9	12.9
53083	44.6N	114.2E	1183	M	122	0	0	34	2.7	6.5	7.0
53352	41.7N	110.4E	1377	M	123	0	0	42	2.3	4.5	5.1
53480	41.0N	113.1E	1416	M	124	0	0	7	2.3	4.2	4.8
54308	41.2N	116.6E	661	M	123	0	0	1	2.3	4.1	4.7
54311	41.9N	117.8E	844	M	124	0	0	2	2.4	4.1	4.8
54386	41.4N	128.2E	1018	M	124	0	0	56	3.2	5.1	6.0
54587	39.1N	123.2E	-78	M	119	0	0	0	1.0	-4.5	4.6
56146	31.6N	100.0E	339	S	124	124	100	0			
56287	30.0N	103.0E	629	M	124	0	0	3	1.8	4.4	4.8
56385	29.5N	103.3E	3049	S	123	0	0	24	2.4	-6.2	6.6
56444	28.5N	98.9E	3488	S	124	8	6	0	0.7	13.6	13.6

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
56462	29.0N	101.5E	2994	S	124	0	0	0	1.9	9.5	9.7
56946	23.6N	99.4E	1104	M	124	0	0	1	1.9	4.2	4.6
56954	22.6N	99.9E	1054	M	123	0	0	0	2.0	4.0	4.5
57006	34.6N	105.8E	1143	M	124	0	0	0	1.7	5.2	5.5
59007	24.1N	105.1E	1251	M	124	0	0	23	2.1	4.4	4.9

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	35	0	0	0	0.9	-8.6	8.6
80410	10.1N	69.3W	613	MS	88	35	40	0	0.5	0.5	0.7
80413	10.3N	67.7W	436	MS	77	25	32	5	2.7	0.3	2.7
80428	9.0N	69.7W	163	MS	90	35	39	6	2.7	-1.3	3.0
80438	8.6N	71.2W	1479	S8	87	36	41	2	1.2	0.1	1.2
80442	8.9N	67.4W	100	MS	87	23	26	1	1.9	0.6	2.0
80475	7.6N	72.1W	327	MS	49	19	39	8	2.4	2.0	3.1
83214	10.3S	54.9W	285	MS	88	0	0	23	4.5	-4.5	6.4
83235	12.4S	46.4W	604	MS	91	0	0	2	1.4	6.8	6.9
83319	14.7S	52.4W	315	MS	88	0	0	0	1.1	4.4	4.5
83332	14.1S	46.4W	826	MS	90	7	8	0	1.0	13.2	13.2
83361	15.6S	56.1W	151	MS	90	0	0	1	1.5	4.1	4.4
83408	14.3S	43.8W	447	MS	87	0	0	0	1.0	11.6	11.6
83488	17.8S	42.9W	1097	MS	89	89	100	0			
83531	18.6S	46.5W	940	MS	77	0	0	0	0.8	-6.5	6.5
83587	19.9S	43.9W	850	MS	88	1	1	0	1.0	-7.2	7.3
83773	23.1S	48.9W	793	MS	92	0	0	0	0.8	-10.4	10.4
83836	25.5S	50.6W	837	MS	90	0	0	2	1.3	-5.1	5.3
83953	30.9S	55.5W	231	MS	90	0	0	0	1.2	-10.6	10.7
84377	3.8S	73.3W	125	MS	104	0	0	0	1.1	4.5	4.6
84425	5.9S	76.1W	179	MS	77	0	0	1	2.3	4.1	4.7
84455	6.5S	76.4W	281	MS	74	0	0	0	1.0	5.2	5.3
84472	7.1S	78.5W	2620	S	45	0	0	0	0.9	-6.1	6.2
84474	7.2S	76.7W	350	S	76	0	0	0	1.2	9.8	9.9
84686	13.6S	72.0W	3248	S	106	0	0	1	0.9	-4.9	5.0
84688	13.7S	73.4W	3444	S	43	0	0	0	2.0	-8.7	8.9
84720	14.9S	75.0W	567	MS	51	0	0	0	1.1	4.1	4.2
84782	18.1S	70.3W	468	MS	80	0	0	0	1.1	7.7	7.8
85140	14.3S	67.4W	140	MS	57	2	4	0	1.6	4.6	4.9
85264	18.5S	64.1W	1998	S	52	52	100	0			
85312	19.8S	63.9W	992	S	43	0	0	2	1.2	-9.4	9.5
85394	22.8S	64.3W	381	MS	43	2	5	0	1.3	4.1	4.3
85406	18.3S	70.3W	55	M	122	0	0	0	1.0	4.3	4.4
85432	22.5S	68.9W	2320	S8	84	0	0	0	0.7	5.8	5.8
86065	22.7S	61.5W	220	M	85	0	0	4	1.6	4.1	4.4

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70194	66.6N	145.3W	131	S	107	41	38	0	1.1	-1.3	1.7
71048	61.6N	125.8W	610	MS	77	0	0	97	1.7	8.9	9.1
71060	52.5N	116.6W	1362	S	116	38	33	1	2.1	0.7	2.2
71134	59.2N	109.7W	238	MS	67	0	0	78	6.0	-4.2	7.3
71215	49.0N	119.4W	283	MS	78	0	0	0	2.1	4.8	5.2
71499	63.2N	101.8W	237	MS	69	0	0	48	4.8	4.8	6.8
71506	66.9N	136.3W	720	S	121	1	1	12	2.2	-6.0	6.4
71882	51.0N	118.2W	443	MS	124	0	0	6	2.8	4.1	5.0
71889	49.5N	119.6W	344	MS	124	0	0	0	2.4	4.7	5.3
71891	50.2N	121.6W	229	MS	124	0	0	0	2.2	4.6	5.1

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
72376	35.2N	111.8W	2192	M	121	0	0	0	3.3	4.9	5.9
72475	38.4N	113.0W	1536	M	115	0	0	37	3.4	4.3	5.5
76118	30.4N	109.7W	1040	MS	31	0	0	0	0.7	-10.5	10.5
76243	28.7N	100.5W	250	MS	90	0	0	31	1.3	5.2	5.4
76412	24.8N	107.4W	39	MS	50	0	0	32	1.2	7.7	7.8
76491	23.8N	99.1W	355	MS	108	0	0	9	1.2	4.4	4.6
76658	19.2N	103.7W	494	MS	39	0	0	0	0.7	6.0	6.0
76743	18.0N	92.9W	10	MS	87	0	0	1	1.4	5.8	6.0
76773	17.8N	97.8W	1650	MS	34	1	3	3	0.9	4.2	4.3
76903	14.9N	92.3W	118	MS	116	0	0	0	0.7	5.6	5.6
78627	15.3N	91.5W	1901	M	32	0	0	0	0.7	4.7	4.8

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	43	0	0	0	0.8	11.3	11.3
92036	2.4S	147.4E	1	8	245	245	100	0			
92068	10.0S	149.4E	1005	MS	50	3	6	4	1.7	-4.3	4.6
94130	14.8S	131.9E	120	MS	123	0	0	0	1.0	5.6	5.7
94868	37.8S	145.0E	35	MS	124	0	0	0	0.9	9.7	9.7
96505	3.7N	115.7E	943	S8	23	23	100	0			
97378	10.7S	123.1E	1	MS	40	37	93	0	0.5	-14.5	14.5

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01245	62.8N	9.7E	671	MS	93	0	0	0	0.8	8.1	8.1
04416	72.6N	38.4W	3202	S	104	0	0	0	1.2	-4.3	4.5
06605	47.1N	7.1E	1599	S8	120	0	0	0	1.0	-4.6	4.7
06685	47.0N	9.1E	515	MS	119	0	0	5	1.3	6.3	6.4
10557	50.5N	11.1E	845	S8	372	372	100	0			
12140	54.4N	18.7E	2	MS	122	0	0	0	0.6	7.4	7.4
13269	44.3N	19.9E	176	MS	110	4	4	3	1.1	7.9	8.0
13369	43.3N	20.0E	1038	8	113	0	0	4	1.0	-4.1	4.2
14528	44.8N	15.9E	246	MS	46	0	0	0	1.5	4.0	4.3
14554	44.9N	18.4E	140	S	51	7	14	4	0.9	-13.6	13.6
14650	43.8N	18.0E	972	S	59	59	100	0			
16470	36.8N	12.0E	191	MS	75	0	0	0	0.8	-4.4	4.5
17092	39.8N	39.5E	1218	S8	121	0	0	0	1.3	8.9	9.0

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	S	221	0	0	0	0.9	8.3	8.3
89266	72.2S	60.3W	91	S	266	228	86	0	1.0	-14.0	14.0
89272	74.8S	71.5W	1369	S	248	248	100	0			
89612	66.3S	110.8E	390	S	185	185	100	0			
89661	73.1S	169.6E	200	S	80	0	0	0	1.4	7.1	7.2
89666	76.7S	163.0E	200	S	31	31	100	0			
89744	74.0S	43.0E	3353	S	278	0	0	0	0.6	7.1	7.1
89769	78.5S	168.4E	50	M	401	401	100	0			
89847	67.6S	146.0E	30	S	323	0	0	0	1.0	-9.9	10.0

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	45	0	64	2.0	1.0	44	0	66	0	10.8	2.3
AAH	933	0	39	1.4	0.1	934	0	40	0	7.4	0.8
AAL	6710	0	22	1.5	0.1	6694	0	22	0	7.1	0.9
AAR	1660	0	6	1.8	-0.4	1655	1	8	0	9.0	0.3
ABX	55	0	44	0.9	-0.2	57	0	53	0	11.0	2.4
ACA	1922	1	3	1.7	0.0	1939	0	3	0	6.5	0.8
ACI	62	5	52	1.3	0.3	62	0	50	0	7.4	2.1
AEA	805	1	5	1.7	0.3	787	1	5	0	9.0	0.5
AEL	638	0	4	1.8	-0.5	634	0	5	0	8.3	0.9
AEY	257	2	4	2.1	1.4	258	0	2	0	6.8	0.7
AFL	461	1	4	2.0	0.5	463	0	5	0	8.8	0.9
AFR	1934	1	8	1.7	-0.1	1945	0	7	0	8.1	1.0
AIH	272	1	5	1.7	-0.2	270	0	6	0	7.9	1.2
AJM	164	0	2	1.1	-0.1	166	0	4	0	8.3	0.3
ALM	88	0	3	1.3	0.1	86	1	7	0	9.2	0.8
AMM	94	0	5	1.6	0.3	100	0	10	0	12.4	-0.1
AMT	827	0	44	2.0	1.2	817	0	44	0	7.4	1.1
AMX	223	2	7	2.3	0.5	231	1	9	0	9.8	0.6
ANA	1049	0	14	1.7	0.9	1054	1	16	0	7.4	0.7
ANZ	6759	0	35	1.4	0.2	6723	0	36	0	7.2	0.7
AOM	1319	1	11	1.6	0.6	1315	0	10	0	7.8	1.2
ARG	85	2	18	2.5	0.8	88	0	64	0	9.8	1.2
AVA	622	0	3	1.9	0.5	626	0	3	0	8.9	0.5
AVE	136	8	10	1.7	0.8	137	0	6	0	9.9	1.0
AVN	174	0	49	1.1	0.1	175	0	50	0	6.4	1.1
AXF	39	5	44	1.9	0.5	37	0	41	0	13.3	-0.2
AZA	599	1	100	2.7	1.0	604	0	5	0	7.6	0.7
BAL	285	0	5	1.5	-0.2	281	0	5	0	6.0	0.9
BAW	1404	0	8	1.7	0.1	1403	0	9	0	6.6	0.9
BBB	45	0	4	2.4	1.0	43	0	5	0	10.1	-0.1
BLC	20	10	20	0.7	0.3	22	0	18	0	11.8	1.3
BLX	56	0	5	1.3	-0.3	57	0	4	0	6.3	1.2
BWA	337	2	7	3.4	2.6	342	0	5	0	9.0	1.1
CAL	264	0	9	1.8	0.5	270	1	10	0	8.3	-0.1
CCA	285	1	14	2.3	0.3	298	1	100	0	13.3	0.0
CDN	1897	0	17	1.7	0.1	1881	0	18	0	8.9	0.2
CES	507	1	7	1.9	0.2	525	1	9	0	10.1	0.3
CFC	39	0	10	2.1	1.3	41	0	15	0	8.2	0.7
CFG	1051	0	3	1.5	-0.7	1042	0	4	0	7.4	0.6
CKS	81	0	38	2.5	1.9	81	0	38	0	6.7	1.3
CLX	413	1	8	1.5	-0.3	418	0	8	0	7.8	0.3
CMI	197	2	4	1.8	0.6	200	0	3	0	8.6	0.2
CMM	461	1	23	1.8	-0.3	450	0	23	0	9.4	1.2
COA	1388	1	30	1.7	0.1	1398	0	30	0	8.8	1.8
CPA	74	0	12	2.2	1.5	81	0	7	0	6.5	1.4
CRL	801	1	8	2.0	0.9	793	1	8	0	9.3	1.1
CSN	137	2	12	1.7	0.1	139	1	13	0	10.5	1.0
CTB	64	0	3	0.8	0.1	66	0	3	0	4.9	0.6
CTM	37	3	19	1.9	-1.4	36	0	19	0	11.7	0.2
CUB	304	1	6	2.5	1.3	307	0	5	0	8.4	0.5
DAL	3183	1	37	1.6	0.2	3215	0	37	0	7.4	0.7
DBY	434	0	3	1.3	-0.1	431	0	5	0	6.9	0.7
DLH	1871	0	6	1.6	0.0	1868	0	6	0	7.6	0.9
EDW	49	2	10	1.8	0.1	48	0	6	0	8.8	0.1
EEZ	48	2	100	3.1	2.3	48	0	6	0	7.1	-0.2
EIA	309	1	41	1.6	0.5	311	0	43	0	9.4	1.1
ELY	100	0	5	1.7	-0.3	103	2	6	0	7.4	1.4
ETH	33	0	9	1.3	-0.6	33	0	12	0	5.7	0.7
EVA	600	1	7	1.8	-0.2	602	0	8	0	7.5	0.2

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
EWW	130	2	6	1.3	0.2	132	1	7	0	6.7	1.2
FDX	2204	0	43	1.6	0.4	2225	0	44	0	7.7	0.8
FIN	458	0	3	1.5	0.1	444	0	5	0	7.0	1.0
FJI	911	1	47	1.4	0.2	882	0	46	0	8.1	0.5
FOM	569	1	29	1.1	-0.1	566	0	29	0	6.5	0.8
FWQ	127	0	51	0.9	0.2	128	0	52	0	5.0	-0.2
GAF	30	0	0	1.6	-0.5	29	0	0	0	4.4	0.0
GCO	299	0	26	1.5	0.4	318	0	100	0	12.1	2.7
GHA	145	2	3	1.5	-0.1	141	0	2	0	10.7	0.7
GRL	59	2	2	1.3	0.2	58	0	3	0	7.6	0.5
GTI	302	0	3	2.0	-0.6	313	0	5	0	9.0	0.9
HAL	4315	0	37	1.5	0.3	4275	0	38	0	9.5	1.4
HLF	160	1	4	1.4	-0.6	160	0	4	0	8.7	0.9
HRH	378	1	65	1.5	-0.2	378	1	65	0	8.8	1.2
HVN	29	0	0	1.6	0.2	29	0	0	0	7.0	0.9
IBE	2804	1	4	1.6	0.4	2782	1	6	0	8.6	0.8
ICE	1123	1	3	1.6	0.4	1086	0	3	0	6.4	0.7
IWD	143	1	4	1.6	-0.6	143	1	4	0	8.4	1.8
JAA	35	0	0	1.6	0.9	38	0	3	0	9.6	0.5
JAL	6860	0	5	1.7	0.2	6870	0	6	0	7.8	0.6
JAZ	999	1	4	1.8	1.1	1005	0	5	0	8.4	0.7
JKK	273	1	4	1.6	0.0	262	1	5	0	8.4	1.3
JMC	225	1	8	2.0	0.9	209	1	8	0	7.7	0.1
KAL	3765	1	9	1.7	0.0	3754	0	10	0	8.3	0.6
KLM	2412	0	9	1.4	0.4	2417	0	10	0	6.7	0.7
LAN	102	3	8	2.0	0.4	113	1	100	0	11.5	2.2
LAP	48	4	33	3.2	1.6	47	0	28	0	8.3	1.4
LDA	120	2	3	1.3	-0.4	122	0	2	0	7.2	1.7
LDI	680	0	100	1.7	-0.6	672	0	6	0	9.1	0.4
LIB	406	1	5	1.9	0.9	415	0	7	0	9.8	0.8
LOT	195	1	5	1.5	-1.0	188	0	6	0	8.1	0.2
LPR	20	0	25	3.5	-1.3	20	0	0	0	9.5	0.3
LTU	506	0	4	1.9	-0.2	504	0	4	0	7.4	0.9
MAS	538	0	4	1.7	0.3	547	1	12	0	13.3	0.4
MON	67	0	1	1.4	0.1	66	0	2	0	8.1	1.4
MPD	287	1	7	1.5	0.1	282	0	7	0	7.7	1.3
MPH	814	0	3	1.7	-0.7	811	0	4	0	7.5	0.6
NCA	688	0	4	1.7	0.0	684	0	4	0	8.2	0.8
NVR	23	0	0	1.2	0.0	23	0	0	0	4.1	0.2
NWA	10777	1	11	1.7	0.6	10779	0	11	0	7.9	0.5
NZL	386	0	15	1.4	0.2	386	0	15	0	6.4	1.8
PAC	589	3	37	1.5	0.2	582	0	36	0	6.7	0.5
PAL	1760	0	11	1.5	0.0	1677	1	13	0	8.6	0.6
PAO	852	1	58	1.5	0.0	841	0	57	0	8.0	1.0
PUA	24	0	42	3.4	0.0	25	8	40	0	8.9	0.5
QFA	5027	0	51	1.3	0.3	5008	0	51	0	6.4	0.4
RAM	82	0	4	1.8	-0.3	83	0	5	0	7.2	0.9
RCH	325	3	18	2.8	1.4	297	0	23	0	11.8	1.8
RJA	29	0	3	1.9	-0.5	29	0	3	0	8.7	-0.3
RKA	91	2	12	1.9	-0.4	91	1	12	0	10.1	0.8
RRR	41	5	20	2.7	-0.4	42	0	10	0	5.7	2.3
RSL	20	5	20	1.2	0.3	20	0	25	0	16.7	-5.1
RYN	300	1	44	1.5	0.9	306	0	44	0	6.5	0.5
RZO	212	4	15	2.3	-0.6	212	2	16	0	12.7	2.2
SAA	411	1	4	1.6	-0.7	402	1	5	0	8.2	1.0
SAS	22	0	36	1.9	0.2	21	0	38	0	4.9	1.6
SIA	550	0	3	1.6	0.3	552	0	3	0	7.0	0.3
SLR	299	1	5	1.5	0.1	299	0	6	0	6.8	0.5
SOL	30	0	0	1.1	0.4	29	0	0	0	5.5	-0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SVA	71	0	6	1.5	-0.1	72	0	7	0	6.4	1.0
SWR	61	0	3	1.4	0.1	63	0	14	0	11.7	3.3
TAM	37	14	43	2.4	1.1	37	0	41	0	18.4	-2.9
TAP	522	1	7	1.8	-0.3	529	1	8	0	9.8	1.3
TBA	47	4	38	1.3	0.8	47	0	36	0	10.8	1.1
THA	282	0	5	1.5	0.1	286	2	62	0	15.1	0.7
THT	103	0	26	1.5	0.2	101	0	27	0	8.9	1.8
TPA	25	0	0	1.5	0.6	25	0	0	0	7.4	2.9
TSC	29	3	21	1.5	0.0	30	0	20	0	8.1	1.0
TWA	2145	0	23	1.6	0.2	2097	0	24	0	7.4	1.0
UAL	144026	0	100	1.2	-0.3	143855	0	100	0	5.2	0.6
UPS	1496	0	42	1.6	0.2	1496	0	43	0	7.5	0.9
USA	207	3	4	1.3	0.0	177	0	3	0	9.0	1.4
VIR	582	1	2	1.4	-0.2	575	0	3	0	7.0	0.9
VKG	129	0	2	1.2	-0.1	130	1	4	0	8.0	0.5
VPB	26	0	0	1.9	1.0	27	0	0	0	6.2	1.8
VRG	298	5	20	2.0	0.7	309	1	100	0	12.2	1.1
VVR	59	0	36	2.9	0.9	60	0	35	0	8.0	-0.7
WOA	266	0	6	1.5	0.5	285	0	8	0	7.5	0.9
YSS	45	0	0	1.0	0.6	45	0	0	0	5.8	0.4
AR	3626	1	100	2.7	2.4	3599	0	6	0	6.4	1.5
AU	54452	0	16	1.2	0.5	54450	0	15	0	5.1	0.4
EU	115093	0	27	1.2	0.3	115093	0	26	0	5.1	0.6
KL	7869	0	20	1.3	0.7	7841	0	20	0	5.7	1.0
LH	2114	0	9	1.5	1.0	2102	0	9	0	5.0	1.0
MK	3452	0	16	1.6	1.2	3418	0	6	0	6.6	0.9
NZ	3082	0	12	0.9	0.1	3082	0	14	0	5.2	0.5
SA	5805	0	14	1.5	0.8	5800	0	14	0	6.9	0.5
SV	273	0	100	2.4	2.2	269	0	7	0	6.5	1.4
WA	372	7	16	1.6	0.6	359	7	67	0	13.5	-1.6
XX	5248	2	10	1.5	0.3	5200	0	10	0	10.3	0.6
N	894	3	30	2.3	0.9	921	0	28	0	7.4	0.7
US ACARS	858279	1	55	1.3	0.3	858271	0	55	0	5.4	0.8

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	382	1	23	1.5	-0.1	379	0	21	0	7.8	0.9
AAR	39	0	28	1.8	0.3	38	0	32	0	11.1	2.7
ABX	46	0	41	1.0	-0.3	48	0	56	0	12.8	0.7
ACI	24	0	67	0.9	0.2	24	0	67	0	4.6	1.5
AFR	72	1	10	1.7	-0.4	72	1	10	0	10.1	0.6
AMT	28	0	39	1.9	1.5	26	0	38	0	6.4	2.4
ANZ	306	3	37	1.3	0.2	307	0	37	0	6.4	0.6
AOM	98	2	8	2.1	1.3	100	2	7	0	6.9	1.0
ARG	25	8	20	3.6	1.3	24	0	71	0	10.0	2.1
AXF	31	0	29	1.1	0.1	30	0	37	0	13.1	2.2
BAF	28	29	39	2.9	1.3	28	0	11	0	12.1	4.0
CFC	140	1	9	1.5	0.8	142	1	14	0	11.3	2.1
CFG	32	0	0	1.1	-0.8	33	0	0	0	6.6	0.1
CLX	20	5	5	1.4	-1.0	20	0	0	0	4.5	0.6
CMI	47	4	13	3.0	-0.7	46	0	4	0	9.6	4.9
COA	138	2	32	1.8	0.4	138	0	29	0	7.6	0.3
CUB	75	1	4	2.2	1.6	75	0	4	0	10.2	0.4
DAF	20	0	10	1.0	0.4	20	0	10	0	4.9	1.1
DAL	396	1	44	1.7	0.3	402	0	43	0	6.0	0.5
DHL	77	6	51	6.2	-6.1	75	0	16	0	16.3	3.7
DLH	216	1	12	1.6	0.4	215	0	12	0	7.6	1.0
EIA	33	3	33	1.8	1.0	34	0	32	0	6.2	0.6
EVA	83	2	22	1.1	-0.4	83	0	22	0	7.3	1.2
EWW	64	9	14	2.0	1.2	68	0	6	0	9.8	-0.2
FDX	292	1	27	1.6	0.8	293	0	28	0	8.1	1.6
FIN	21	0	0	1.4	0.4	21	0	0	0	4.8	-0.9
GAF	56	0	2	1.9	0.6	56	0	0	0	5.4	1.1
GCO	155	1	10	1.4	0.4	161	1	100	0	17.7	7.1
GHA	78	3	5	1.6	-0.3	76	1	5	0	12.2	0.4
HAL	287	1	39	1.6	0.2	285	0	38	0	8.4	1.1
HLA	25	0	0	1.4	-0.8	25	0	0	0	10.1	1.0
IBE	121	2	15	1.3	0.1	122	0	17	0	8.1	1.4
ICE	98	0	2	1.2	-0.2	92	0	2	0	7.2	1.3
JAA	26	0	0	1.7	0.5	27	0	0	0	5.7	1.4
JAL	146	3	10	1.6	-0.3	147	0	7	0	7.7	1.2
JAZ	182	1	5	1.9	1.0	183	0	5	0	9.5	1.1
JMC	28	0	4	1.5	0.8	28	0	4	0	8.4	-0.4
KAL	53	2	21	1.3	-0.3	53	0	19	0	6.7	1.4
KIW	127	5	32	3.5	1.6	70	0	20	0	10.7	1.4
KLM	110	0	12	1.6	0.3	110	0	13	0	8.8	1.6
LAN	90	7	13	3.0	0.2	106	0	100	0	11.4	4.9
LIB	27	4	4	1.7	1.2	26	0	0	0	5.9	0.9
MAS	46	0	13	1.9	0.8	46	0	22	0	13.9	-0.2
MPH	37	0	5	1.0	-0.1	37	3	11	0	7.2	1.4
NCA	91	0	3	1.9	-0.2	91	0	4	0	6.0	0.8
NWA	503	2	19	1.6	0.9	511	0	17	0	7.2	0.8
NZL	1091	0	52	1.5	0.0	1091	0	52	0	6.1	0.7
PAC	50	0	30	1.3	0.0	51	0	37	0	12.5	2.2
PAL	33	0	3	1.4	-0.8	32	0	3	0	7.7	1.8
QFA	289	6	49	1.5	0.1	293	0	47	0	7.5	0.4
RCH	182	1	10	2.0	0.4	185	0	16	0	12.8	2.3
RRR	130	1	8	3.4	2.1	138	0	10	0	9.6	1.2
SAA	79	0	3	1.7	-0.5	78	0	1	0	5.3	-1.4
SIA	69	0	1	1.0	0.2	69	0	1	0	4.4	0.3
SKI	114	6	17	3.9	-1.3	52	0	8	0	8.6	0.1
SWR	37	0	22	2.7	-0.4	38	0	34	0	17.2	6.0
UAL	230517	0	100	1.2	-0.1	230181	0	100	0	4.6	0.2
UPS	73	1	34	1.4	0.4	76	0	34	0	7.4	1.9
VHJ	68	0	0	1.5	0.6	65	0	0	0	8.5	0.4

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
VTA	40	0	0	2.4	-1.3	43	0	0	0	5.2	1.4
VVP	40	13	63	4.9	-1.1	40	0	53	0	11.8	-0.1
AR	2865	1	100	2.0	1.3	2824	0	54	0	5.1	0.6
AU	105226	0	67	1.6	0.0	105223	0	67	0	4.4	0.4
EU	563770	0	75	1.2	0.2	562978	0	75	0	4.1	0.1
KL	5384	0	57	1.3	0.6	5358	0	57	0	4.2	0.3
LH	922	0	62	1.6	0.3	922	0	63	0	4.8	0.6
MK	2745	0	58	1.3	0.4	2721	0	53	0	4.5	0.8
NZ	9395	0	56	1.5	0.1	9395	0	57	0	5.1	0.7
SA	4185	0	57	1.5	0.1	4177	0	58	0	5.0	1.2
SV	620	0	100	3.0	2.7	615	0	50	0	4.2	0.7
WA	85	16	20	1.9	0.7	82	5	73	0	18.5	-7.1
XX	1364	4	9	1.7	0.1	1357	0	13	0	13.5	1.2
N	25	8	48	5.0	3.2	36	3	25	0	6.8	1.3
US ACARS	1229779	0	71	1.4	0.3	1227422	0	71	0	4.7	0.2

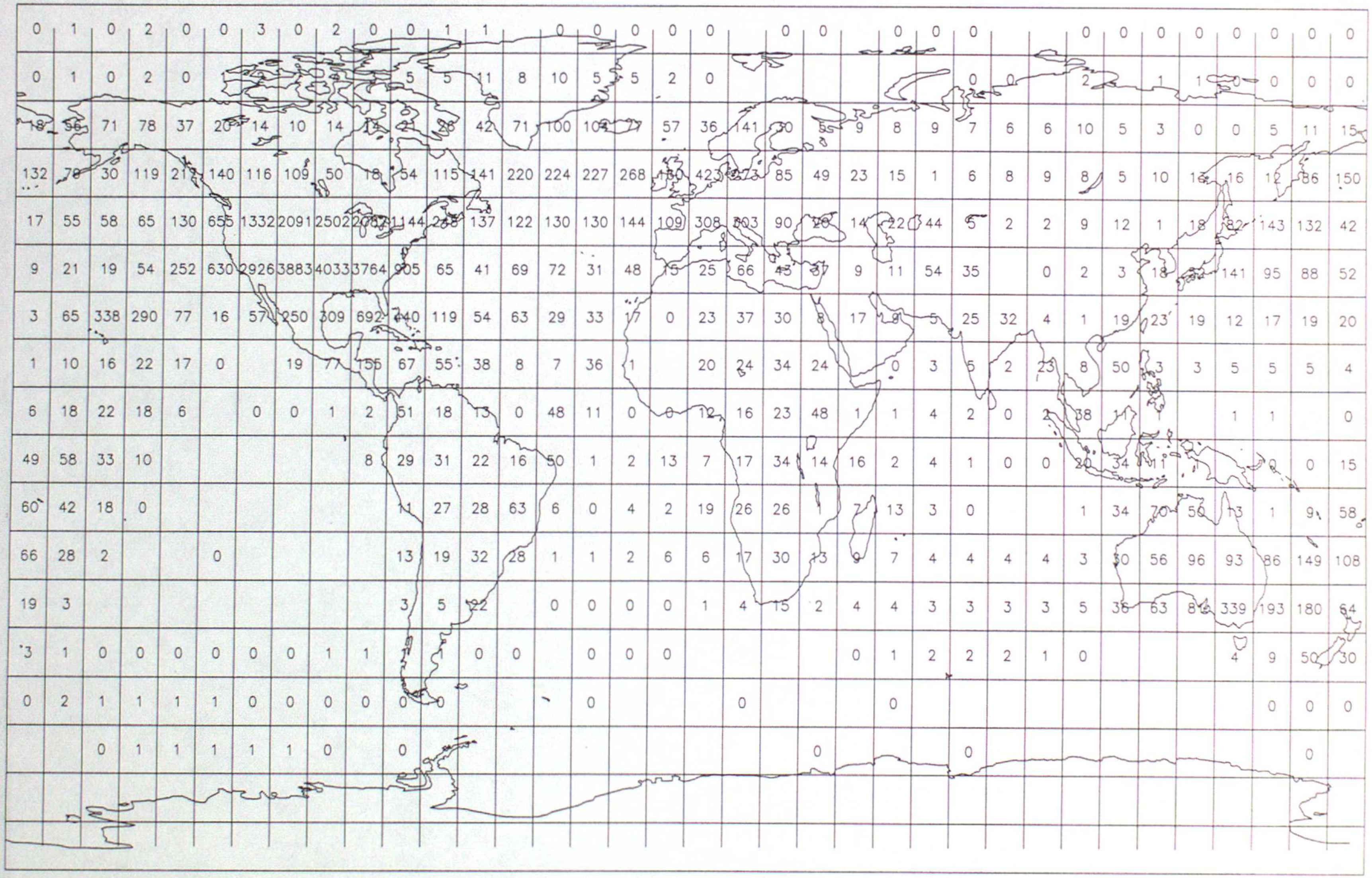
MEAN DAILY COUNT OF AIRCRAFT 300 – 150 HPA

DECEMBER 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 42271

FIGURE 3A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9 21 19 54 252 630 2926 3883 4033 3764 905 65 41 69 72 31 48 15 25 66 45 37 9 11 54 35 0 2 3 18 141 95 88 52
3 65 338 290 77 16 57 250 309 692 440 119 54 63 29 33 17 0 23 37 30 8 17 19 5 25 32 4 1 19 23 19 12 17 19 20
1 10 16 22 17 0 19 77 155 67 55 38 8 7 36 1 20 24 34 24 0 3 5 2 23 8 50 3 3 5 5 5 4
6 18 22 18 6 0 0 1 2 51 18 13 0 48 11 0 0 12 16 23 48 1 1 4 2 0 2 38 11 1 1 0
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66 28 2 0 13 19 32 28 1 1 2 6 6 17 30 13 9 7 4 4 4 4 3 30 56 96 93 86 149 108
19 3 3 5 22 0 0 0 0 1 4 15 2 4 4 3 3 3 3 5 36 63 81 339 193 180 64
3 1 0 0 0 0 0 0 1 1 1 1 0 0 0 0 0 0 1 2 2 2 1 0 4 9 50 30
0 2 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0
0 1 1 1 1 1 0 0 0 0 0 0

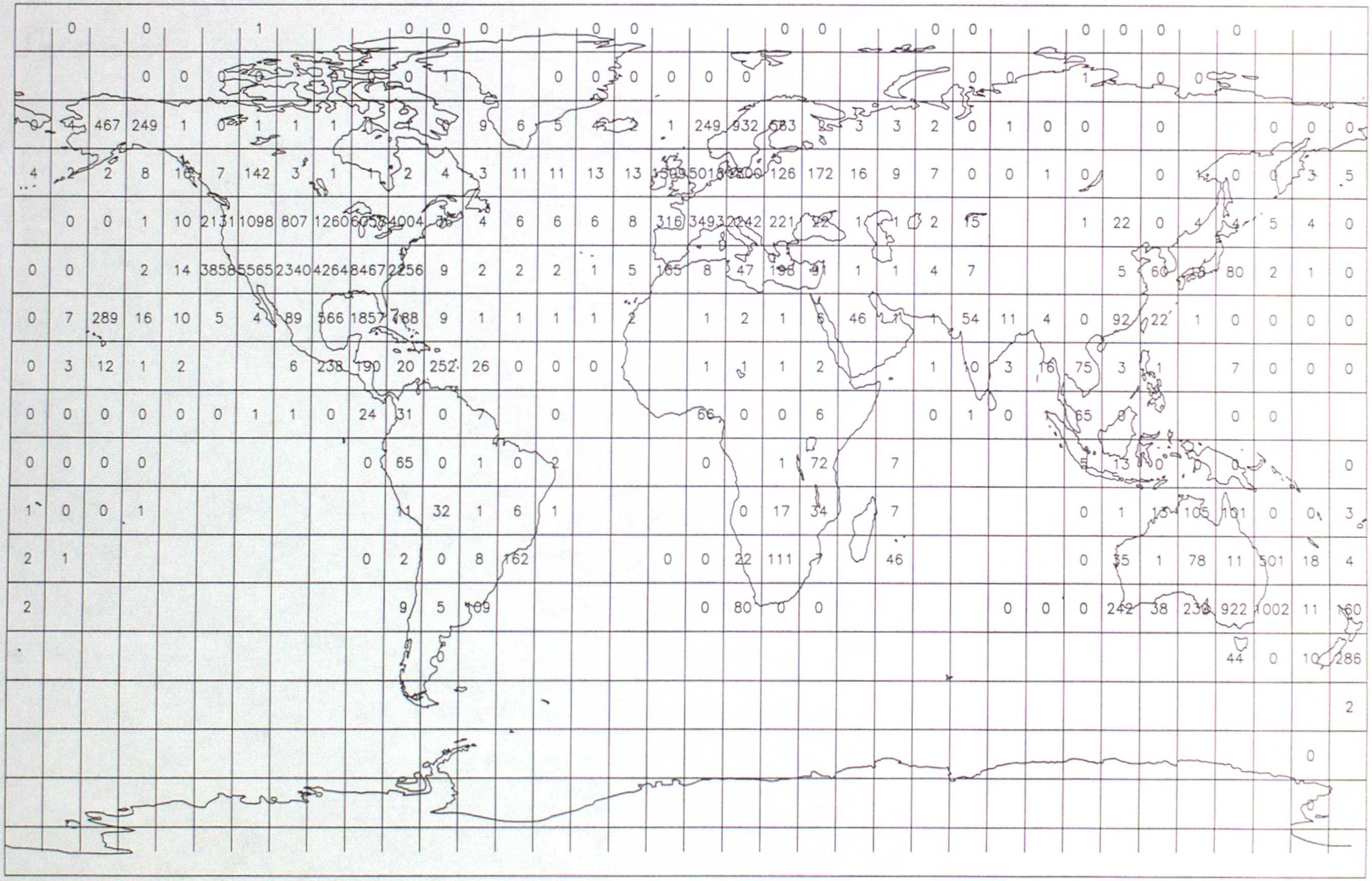
MEAN DAILY COUNT OF AIRCRAFT 1000 – 301 HPA

FIGURE 3B

DECEMBER 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 69707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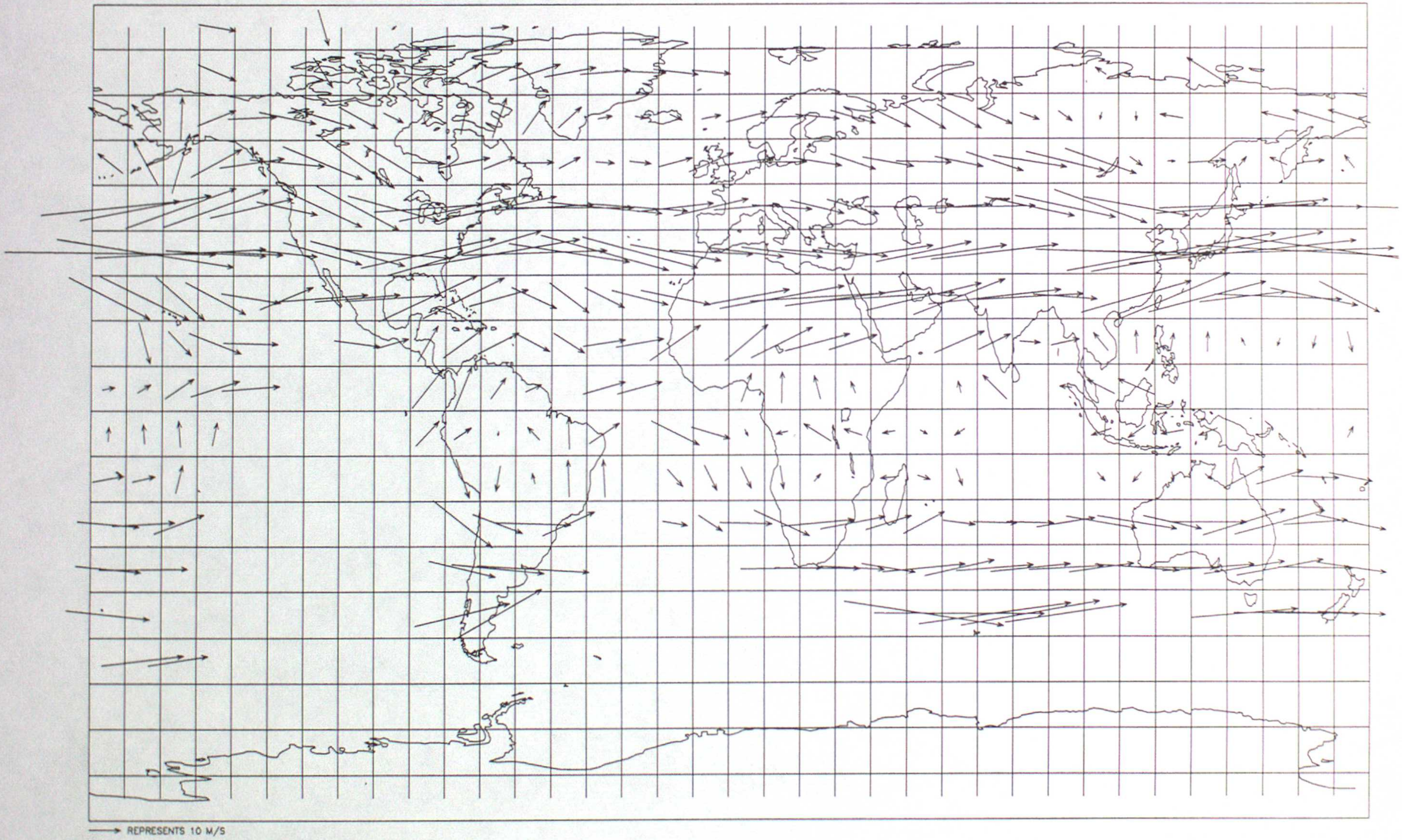
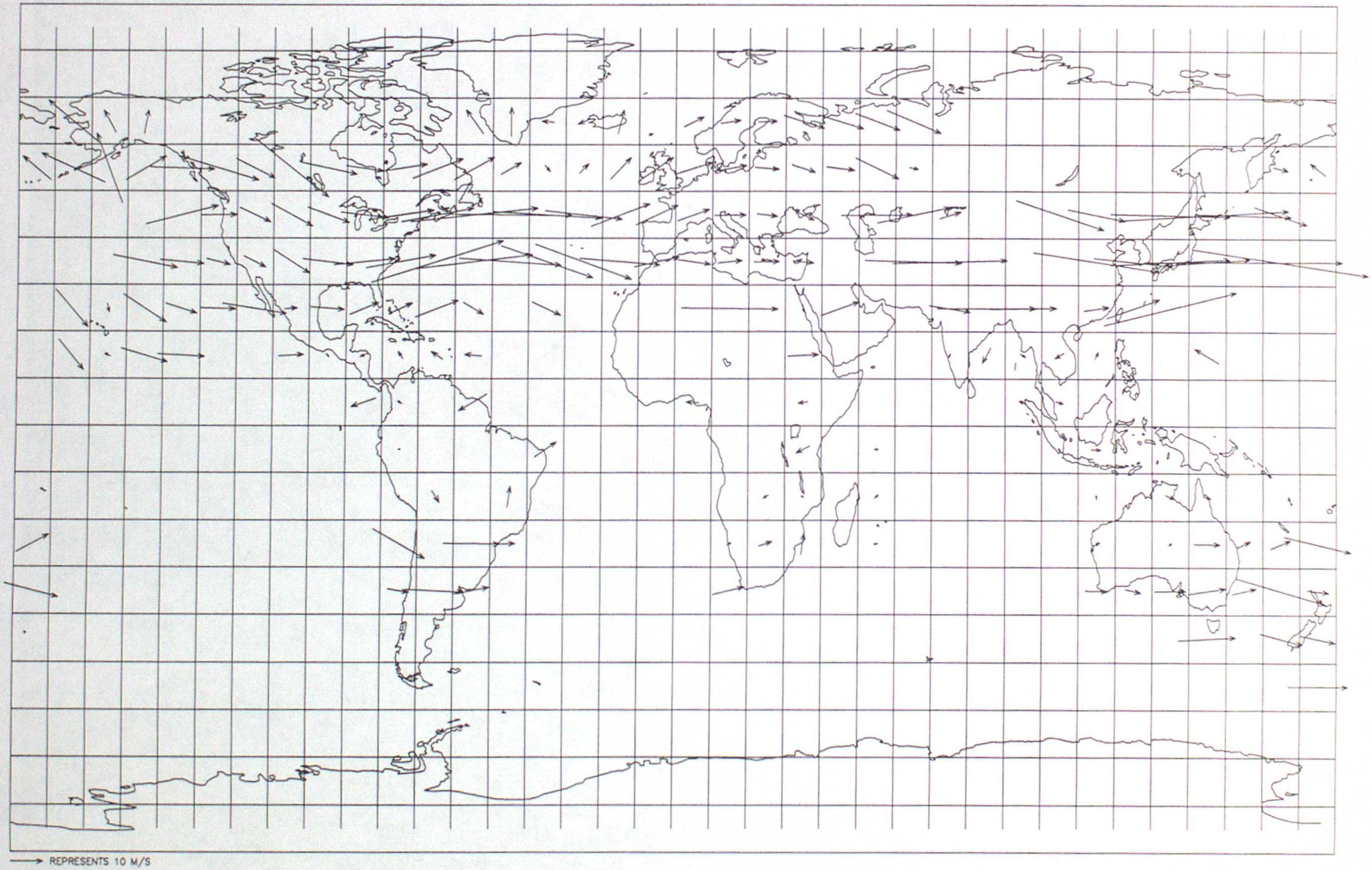
1 0 0 1 11 32 1 6 1 0 17 34 7 0 1 13 105 101 0 0 3
2 1 0 2 0 8 162 0 0 22 111 7 46 0 35 1 78 11 501 18 4
2 9 5 109 0 80 0 0 0 0 0 242 38 230 922 1002 11 160
44 0 10 286
2
0

AIRCRAFT MEAN WINDS BETWEEN 300 AND 150 HPA
DECEMBER 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 4A



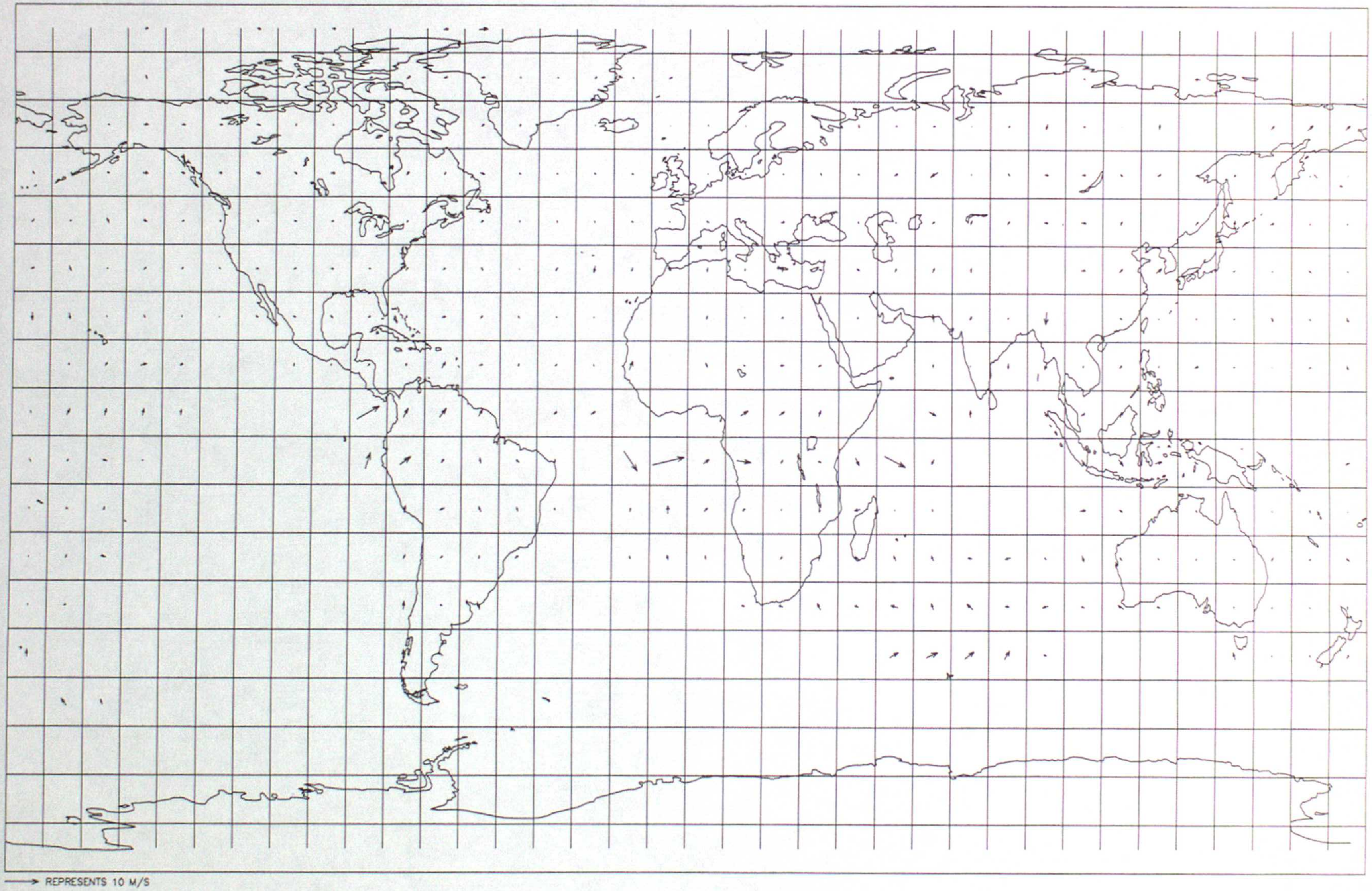
AIRCRAFT MEAN WINDS BETWEEN 1000 AND 301 HPA FIGURE 4B
DECEMBER 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT MEAN O–B WINDS BETWEEN 300 AND 150 HPA

FIGURE 5A

DECEMBER 2000
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



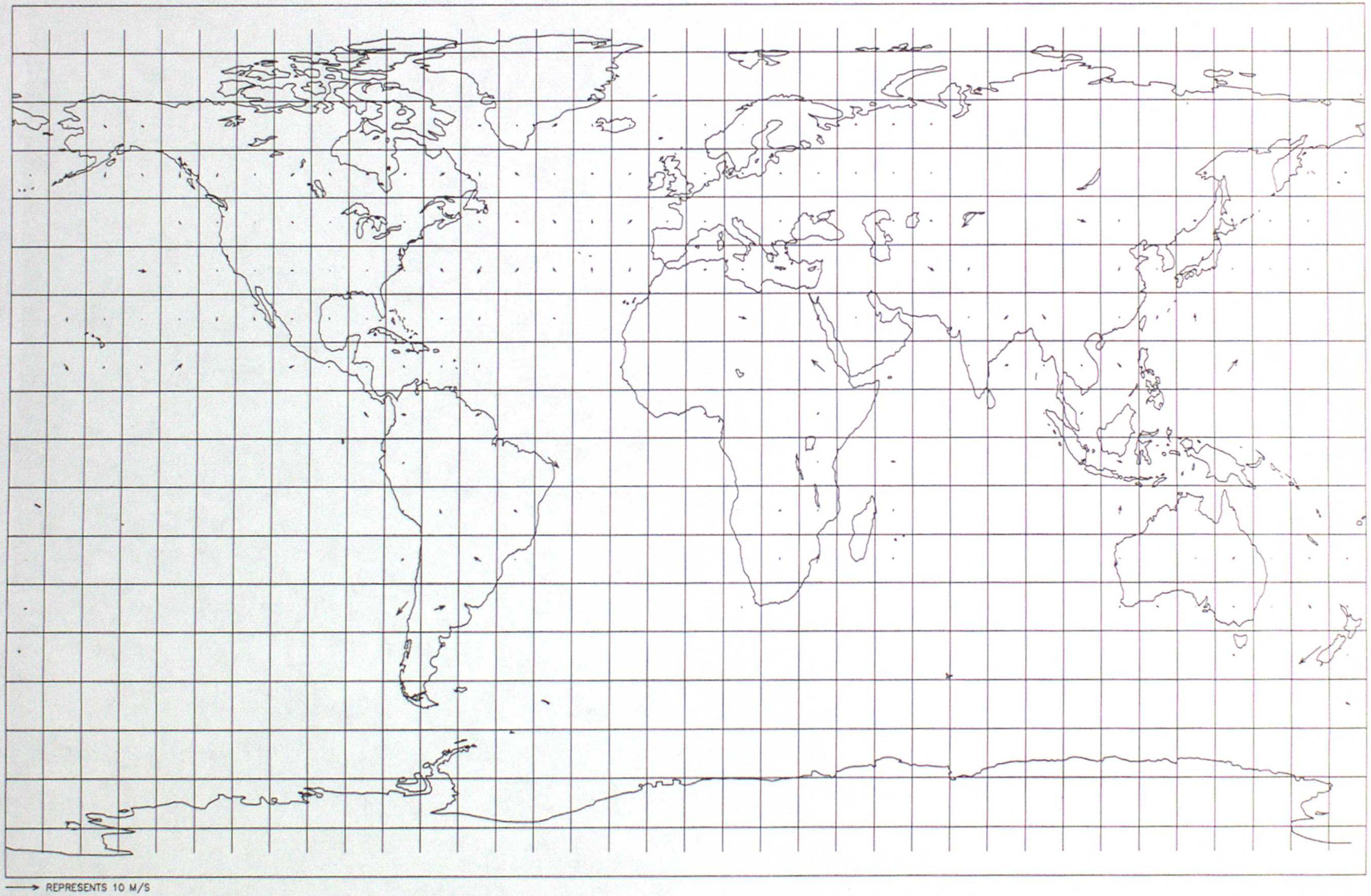
AIRCRAFT MEAN O–B WINDS BETWEEN 1000 AND 301 HPA

FIGURE 5B

DECEMBER 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



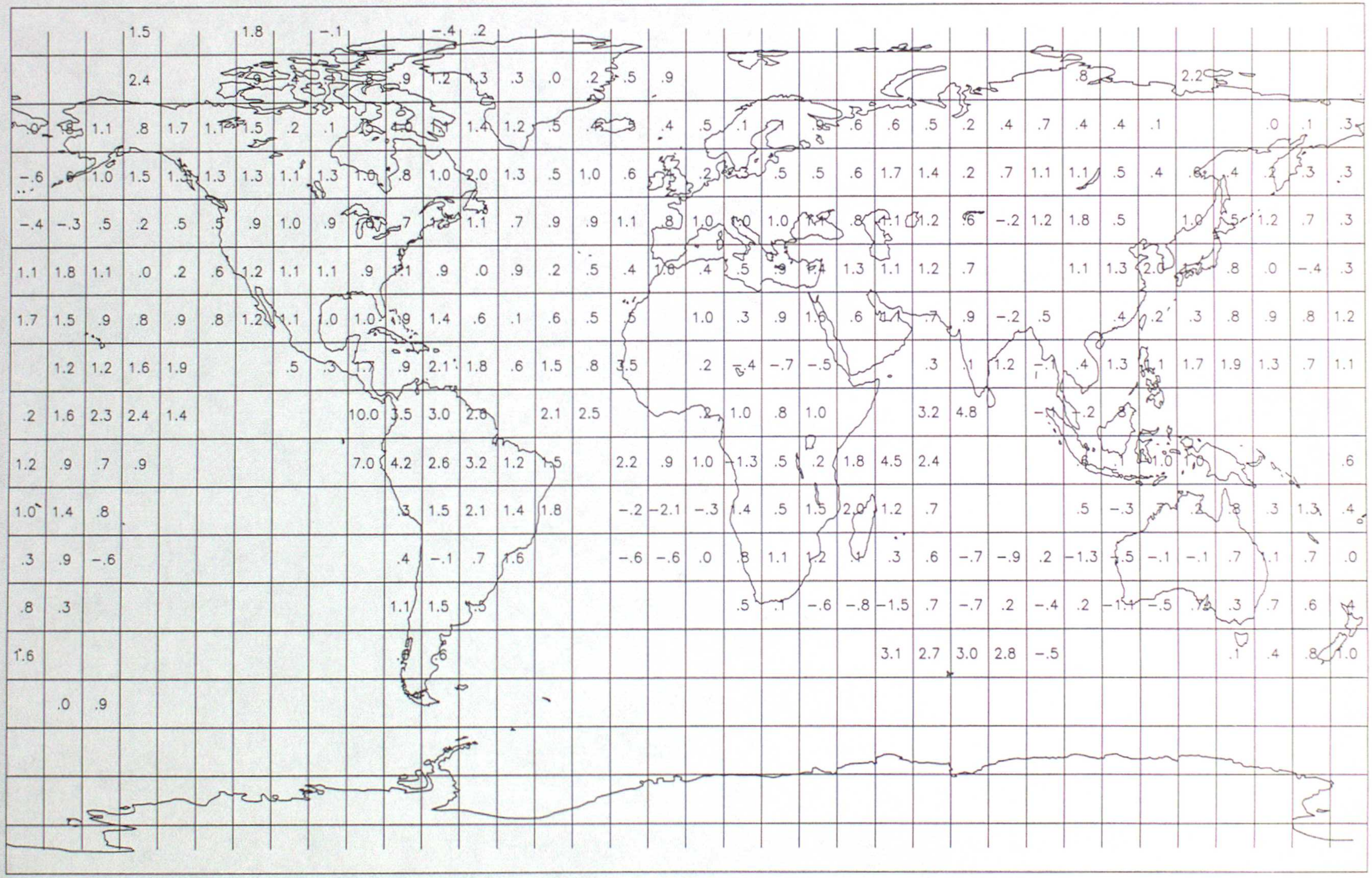
AIRCRAFT : MEAN O–B SPEEDS (M/S) 300 – 150 HPA

DECEMBER 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED

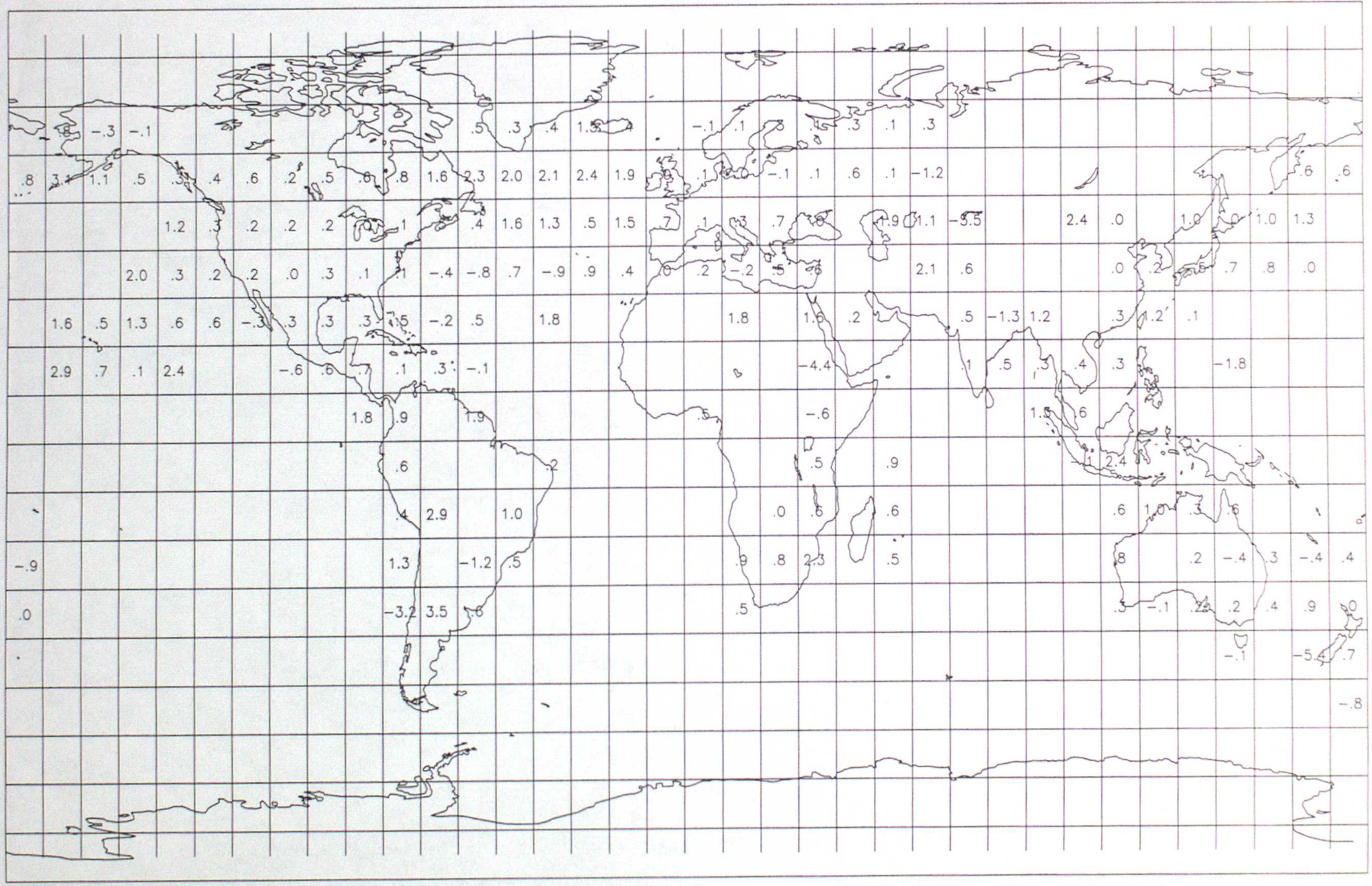
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 6A


1.5 1.8 -.1 -.4 .2
2.4 .9 .9 1.2 1.3 .3 .0 .2 .5 .9 .8 2.2
.0 .8 1.1 .8 1.7 1.1 1.5 .2 .1 .5 4.0 1.1 1.4 1.2 .5 .4 .4 .5 .1 .1 .9 .6 .6 .5 .2 .4 .7 .4 .4 .1 .0 .1 .3
-.6 .6 1.0 1.5 1.3 1.3 1.3 1.1 1.3 1.0 .8 1.0 2.0 1.3 .5 1.0 .6 .4 .2 .3 .5 .5 .6 1.7 1.4 .2 .7 1.1 1.1 .5 .4 .6 .4 .2 .3 .3
-.4 -.3 .5 .2 .5 .5 .9 1.0 .9 1.0 .7 1.3 1.1 .7 .9 .9 1.1 .8 1.0 1.0 1.0 1.1 .8 1.1 1.2 .6 -.2 1.2 1.8 .5 1.0 .5 1.2 .7 .3
1.1 1.8 1.1 .0 .2 .6 1.2 1.1 1.1 .9 1.1 .9 .0 .9 .2 .5 .4 1.8 .4 .5 .9 1.4 1.3 1.1 1.2 .7 1.1 1.3 2.0 1.1 .8 .0 -.4 .3
1.7 1.5 .9 .8 .9 .8 1.2 1.1 1.0 1.0 .9 1.4 .6 .1 .6 .5 .5 1.0 .3 .9 1.5 .6 1.1 .7 .9 -.2 .5 .4 .2 .3 .8 .9 .8 1.2
1.2 1.2 1.6 1.9 .5 .3 1.7 .9 2.1 1.8 .6 1.5 .8 3.5 .2 .4 -.7 -.5 .3 .1 1.2 -.1 .4 1.3 1.1 1.7 1.9 1.3 .7 1.1
.2 1.6 2.3 2.4 1.4 10.0 3.5 3.0 2.8 2.1 2.5 .2 1.0 .8 1.0 3.2 4.8 -.1 -.2 .8
1.2 .9 .7 .9 7.0 4.2 2.6 3.2 1.2 1.5 2.2 .9 1.0 -1.3 .5 .2 1.8 4.5 2.4 .6 .1 1.0 1.0 .6
1.0 1.4 .8 .3 1.5 2.1 1.4 1.8 -.2 -2.1 -.3 1.4 .5 1.5 2.0 1.2 .7 .5 -.3 .7 .2 .8 .3 1.3 .4
.3 .9 -.6 .4 -.1 .7 1.6 -.6 -.6 .0 .8 1.1 1.2 .1 .3 .6 -.7 -.9 .2 -1.3 -.5 -.1 -.1 .7 1.1 .7 .0
.8 .3 1.1 1.5 1.5 .5 .1 -.6 -.8 -1.5 .7 -.7 .2 -.4 .2 -1.1 -.5 .72 .3 .7 .6 .4
1.6 .6 .6 3.1 2.7 3.0 2.8 -.5 .1 .4 .8 1.0
.0 .9

AIRCRAFT : MEAN O-B SPEEDS (M/S) 1000 - 301 HPA
DECEMBER 2000
OBSERVATIONS WITH O-B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 6B


.8 -.3 -.1 .5 .3 .4 1.5 .4 -.1 .1 .3 .3 .1 .3
.8 3.4 1.1 .5 .3 .4 .6 .2 .5 .6 .8 1.6 2.3 2.0 2.1 2.4 1.9 .1 .0 -.1 .1 .6 .1 -1.2 .6 .6
1.2 .3 .2 .2 .2 .1 .4 1.6 1.3 .5 1.5 .7 .1 .3 .7 .8 1.9 1.1 -3.5 2.4 .0 1.0 .0 1.0 1.3
2.0 .3 .2 .2 .0 .3 .1 .1 -.4 -.8 .7 -.9 .9 .4 .0 .2 -.2 .5 .6 2.1 .6 .0 .2 .5 .7 .8 .0
1.6 .5 1.3 .6 .6 -.3 .3 .3 .3 .5 -.2 .5 1.8 1.8 1.5 .2 .5 -1.3 1.2 .3 1.2 .1
2.9 .7 .1 2.4 -.6 .6 .7 .1 .3 -.1 -4.4 .1 .5 .3 .4 .3 -1.8
1.8 .9 1.9 .5 -.6 1.5 .6
.6 .2 .5 .9 .1 2.4
.4 2.9 1.0 .0 .6 .6 .6 1.0 .3 .6
-.9 1.3 -1.2 .5 .9 .8 2.3 .5 .8 .2 -.4 .3 -.4 .4
.0 -3.2 3.5 .6 .5 .3 -.1 .2 .2 .4 .9 .0
-.1 -5.4 .7
-.8

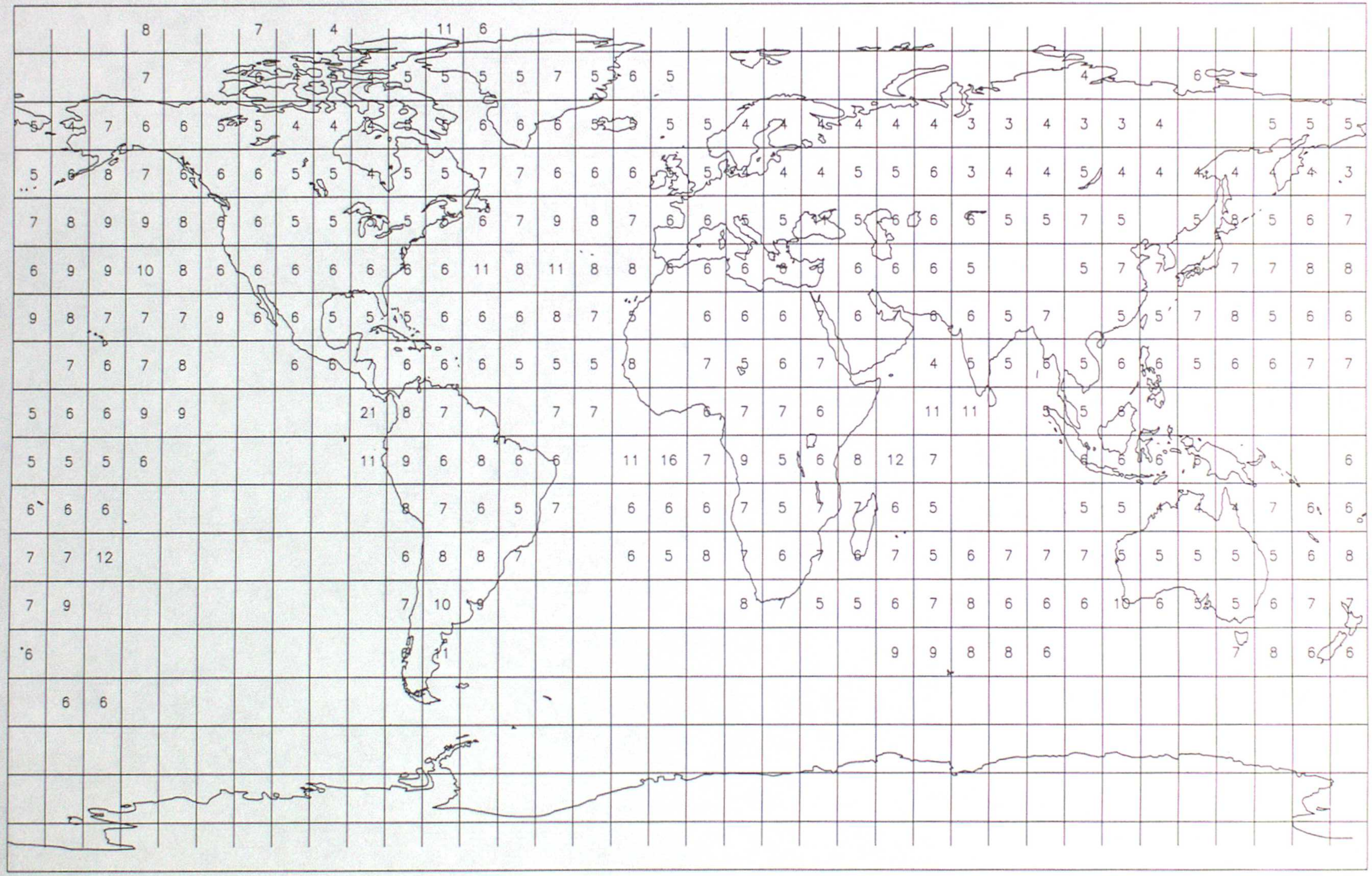
AIRCRAFT : RMS O-B VECTOR (M/S) 300 - 150 HPA

FIGURE 7A

DECEMBER 2000

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


8 7 4 11 6
7 6 4 4 4 5 5 5 5 7 5 6 5 4 6
5 4 7 6 6 5 5 4 4 4 5 5 6 6 6 5 5 5 5 4 4 4 4 4 4 3 3 4 3 3 4 5 5 5
5 6 8 7 6 6 6 5 5 4 5 5 7 7 6 6 6 5 5 4 4 4 5 5 6 3 4 4 5 4 4 4 4 4 4 3
7 8 9 9 8 6 6 5 5 5 5 6 6 7 9 8 7 6 6 5 5 4 5 6 6 6 5 5 7 5 5 8 5 6 7
6 9 9 10 8 6 6 6 6 6 6 6 11 8 11 8 8 6 6 6 6 6 6 6 6 5 5 7 7 7 7 8 8
9 8 7 7 7 9 6 6 5 5 5 6 6 6 8 7 5 6 6 6 7 6 7 6 6 5 7 5 5 7 8 5 6 6
7 6 7 8 6 6 7 6 6 6 5 5 5 8 7 5 6 7 4 5 5 5 5 6 6 5 6 6 7 7
5 6 6 9 9 21 8 7 7 7 7 6 7 7 6 11 11 5 5 8
5 5 5 6 11 9 6 8 6 6 11 16 7 9 5 6 8 12 7 6 6 6 5 6
6 6 6 8 7 6 5 7 6 6 6 7 5 7 7 6 5 5 5 4 4 4 7 6 6
7 7 12 6 8 8 7 6 5 8 7 6 7 6 7 5 6 7 7 7 5 5 5 5 5 6 8
7 9 7 10 9 8 7 5 5 6 7 8 6 6 6 10 6 5 5 6 7 7
6 11 9 9 8 8 6 7 8 6 6
6 6

AIRCRAFT : RMS O-B VECTOR (M/S) 1000 - 301 HPA

FIGURE 7B

DECEMBER 2000

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

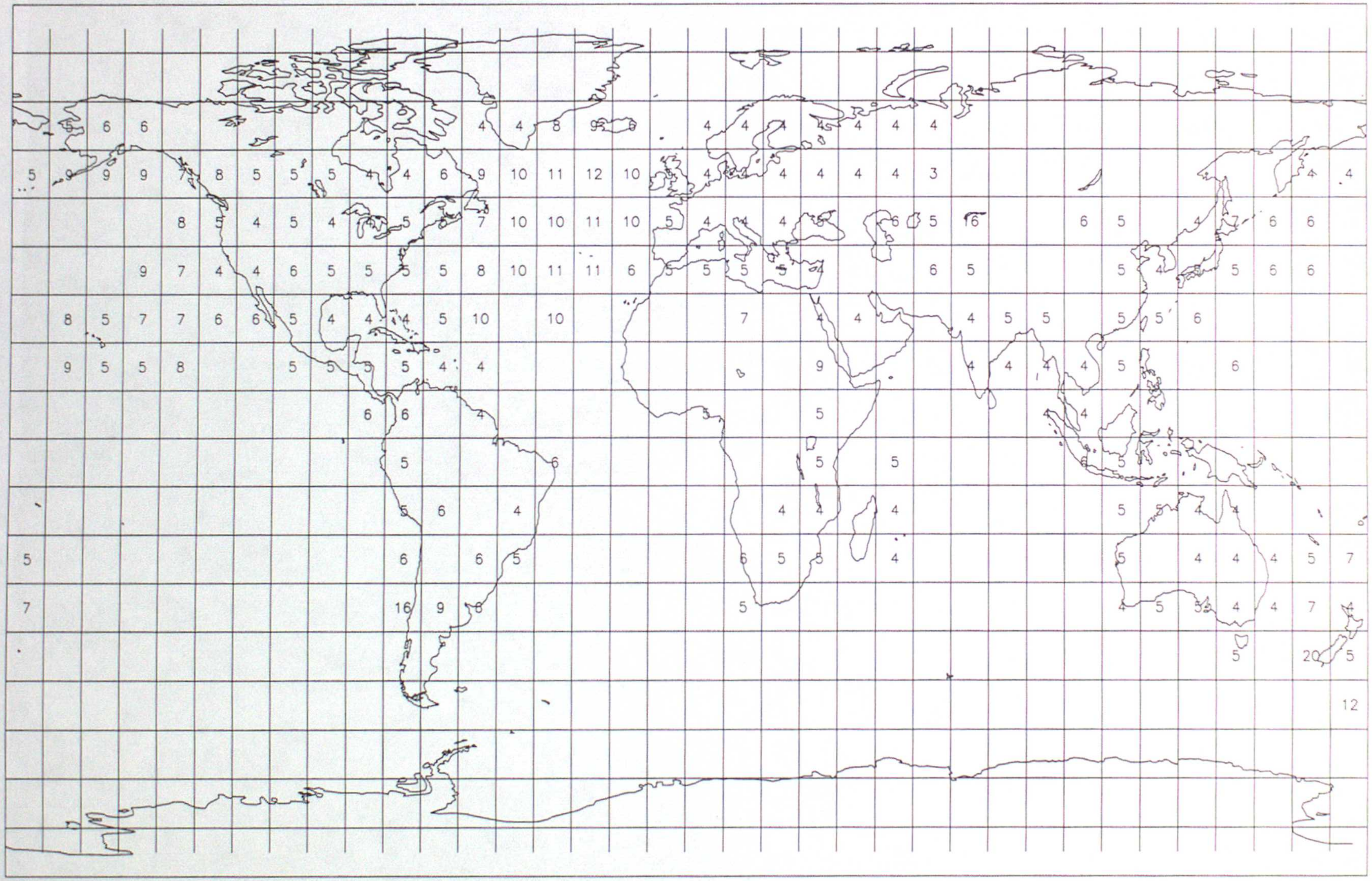

5 6 6 4 4 8 9 6 4 4 4 4 4 4 4
5 9 9 9 7 8 5 5 5 4 4 6 9 10 11 12 10 5 4 4 4 4 4 4 3 4 4
8 5 4 5 4 4 5 5 7 10 10 11 10 5 4 4 4 5 6 5 16 6 5 4 7 6 6
9 7 4 4 6 5 5 5 5 8 10 11 11 6 5 5 5 5 4 6 5 5 4 5 5 6 6
8 5 7 7 6 6 5 4 4 4 5 10 10 7 4 4 4 5 5 5 5 6
9 5 5 8 5 5 5 5 4 4 9 4 4 4 4 5 6
6 6 4 5 5 4 4
5 6 5 5 6 5
5 6 4 4 4 4 5 5 4 4
5 6 6 5 6 5 5 4 5 4 4 4 5 7
7 16 9 6 5 4 5 5 4 4 7 4
5 20 5
12

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
24125	12	Z	850	68/ 112	22	0	26.4	-34.6	43.5	5
24343	00	Z	500	67/ 123	30	0	13.8	-48.7	50.6	4
24944	00	Z	850	60/ 120	24	0	14.2	-34.6	37.4	4
24959	00	Z	700	62/ 130	30	0	9.1	-41.9	42.9	5
24959	12	Z	500	62/ 130	29	0	15.4	-53.4	55.6	4
30372	12	Z	1000	57/ 118	30	0	24.7	56.1	61.3	5
30673	12	Z	850	54/ 120	25	0	8.7	-42.9	43.8	4
31004	12	Z	850	59/ 125	29	0	12.1	-32.4	34.6	4
33345	00	Z	70	50/ 31	28	0	30.5	-150.6	153.7	7
33631	00	Z	100	49/ 22	23	0	29.1	-100.4	104.6	4
42101	12	Z	30	30/ 76	13	0	111.4	237.7	262.5	5
42339	00	Z	200	26/ 73	19	0	74.5	-51.6	90.6	5
42369	00	Z	100	27/ 81	22	0	102.9	-84.9	133.4	4
42369	12	Z	200	27/ 81	24	1	80.0	-65.3	103.3	8
42397	00	Z	200	27/ 88	10	0	83.8	-105.4	134.6	6
42397	12	Z	200	27/ 88	11	0	48.0	-105.6	116.0	6
42410	00	Z	50	26/ 92	10	1	129.0	137.8	188.7	6
42492	12	Z	150	26/ 85	26	0	81.0	-54.0	97.4	5
42647	12	Z	50	23/ 73	12	1	91.7	222.7	240.8	9
42724	00	Z	70	24/ 91	18	1	136.3	62.7	150.0	6
42724	12	Z	150	24/ 91	18	0	84.8	-101.4	132.2	8
42809	00	Z	70	23/ 88	24	1	116.0	147.7	187.8	6
42971	00	Z	70	20/ 86	24	0	120.3	122.2	171.5	6
42971	12	Z	70	20/ 86	25	1	129.5	35.4	134.3	4
43003	12	Z	100	19/ 73	4	14	16.4	273.0	273.5	6
43014	00	Z	150	20/ 75	19	0	86.9	-73.3	113.7	5
43041	00	Z	1000	19/ 82	25	0	5.7	36.7	37.1	7
43041	12	Z	200	19/ 82	17	0	77.0	17.7	79.0	5
43128	12	Z	50	17/ 78	17	1	92.3	187.2	208.8	6
43185	00	Z	150	16/ 81	28	0	70.0	-67.0	96.9	4
43279	12	Z	50	13/ 80	19	0	106.6	169.9	200.6	4
43285	12	Z	50	13/ 75	12	0	100.6	184.7	210.4	5
43295	12	Z	50	13/ 78	21	3	118.3	150.9	191.7	6
43333	00	Z	50	12/ 93	23	0	93.4	182.8	205.3	4
43346	00	Z	150	11/ 80	30	0	85.2	-73.6	112.6	7
43346	12	Z	50	11/ 80	21	0	98.4	167.4	194.2	4
43353	12	Z	70	10/ 76	10	1	94.9	153.1	180.1	5
43369	12	Z	50	8/ 73	10	0	81.0	250.4	263.2	7
43371	12	Z	70	8/ 77	12	0	127.0	143.0	191.2	6
43466	12	Z	150	7/ 80	4	1	60.6	160.5	171.6	6
53463	00	Z	250	41/ 112	24	2	64.3	-127.9	143.2	8
53463	12	Z	250	41/ 112	13	0	49.2	-116.3	126.3	5
56739	00	Z	1000	25/ 98	9	20	5.8	93.7	93.8	5
56739	12	Z	1000	25/ 98	28	2	10.6	79.5	80.2	5
56964	12	Z	70	23/ 101	27	0	38.8	146.0	151.1	4
57972	12	Z	70	26/ 113	26	0	47.5	164.8	171.5	4
59981	00	Z	70	17/ 112	19	0	43.1	155.5	161.4	4
72520	00	Z	1000	40/ 80	22	4	59.4	-9.1	60.0	13
72520	12	Z	1000	40/ 80	20	7	64.6	-5.5	64.8	12
82824	12	Z	50	-9/ -64	21	0	60.1	188.8	198.2	4
83971	12	Z	200	-30/ -51	1	0	0.0	91.0	91.0	4
84628	12	Z	850	-12/ -77	28	0	6.3	-72.4	72.7	8
91366	00	Z	50	9/ 168	14	11	51.7	335.1	339.1	7
91366	12	Z	50	9/ 168	23	0	95.2	160.5	186.6	4
97180	00	Z	150	-5/ 120	15	0	91.4	-70.1	115.2	8
97560	00	Z	250	-1/ 136	12	0	23.3	-77.3	80.7	5

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – DECEMBER 2000 FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1138

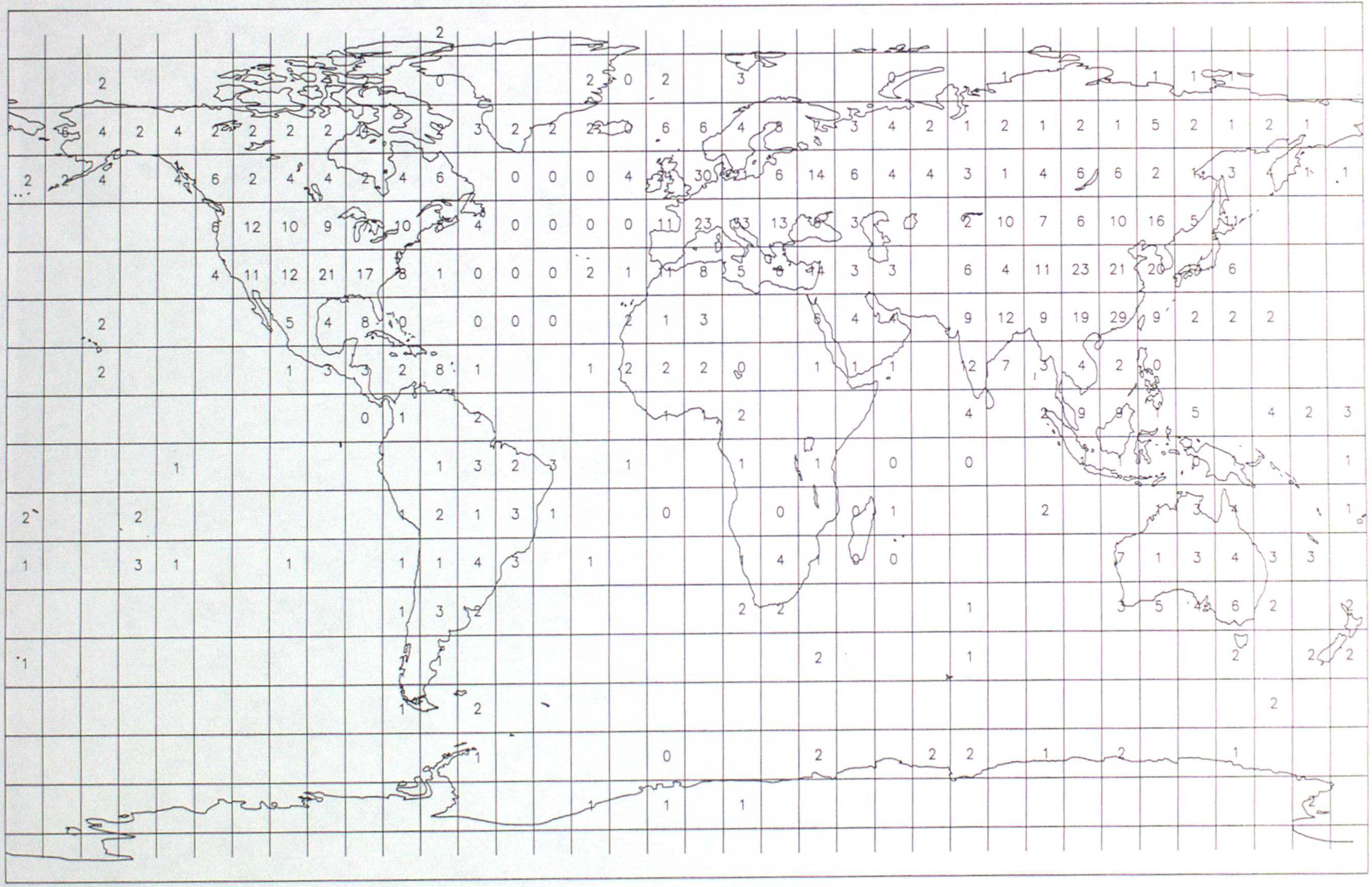

2
2 0 2 0 2 3 0 1 1 1
6 4 2 4 2 2 2 2 3 2 2 2 6 6 4 8 3 4 2 1 2 1 2 1 5 2 1 2 1
2 2 4 4 6 2 4 4 2 4 6 0 0 0 4 30 6 14 6 4 4 3 1 4 6 6 2 3 1
6 12 10 9 10 4 0 0 0 0 11 23 33 13 3 2 10 7 6 10 16 5
4 11 12 21 17 8 1 0 0 0 2 1 8 5 3 3 6 4 11 23 21 20 6
2 5 4 8 0 0 0 0 2 1 3 5 4 9 12 9 19 29 9 2 2 2
2 1 3 3 2 8 1 1 2 2 2 0 1 1 1 12 7 3 4 2 0
0 1 2 1 2 4 2 9 9 1 5 4 2 3
1 1 3 2 3 1 1 1 0 0 1
2 2 1 2 1 3 1 0 0 0 1 2 3 1
1 3 1 1 1 1 4 3 1 4 0 0 7 1 3 4 3 3
1 3 2 2 2 1 3 5 4 6 2 2
1 1 2 1 2 2 2
1 2 2
1 0 2 2 2 1 2 1
1 1 1 2

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	150	-5/ -81	31	0	100	-11.3	-1.0	29.8	4
PSPIU	12	V	150	-5/ -81	30	0	100	-14.3	-5.3	31.0	6
42314	00	V	300	27/ 95	16	0	6	3.4	1.1	15.3	1
42339	00	V	200	26/ 73	20	0	100	-12.0	-14.8	20.8	3
42339	12	V	250	26/ 73	15	0	100	-8.6	-8.2	16.2	1
42369	00	V	200	27/ 81	25	0	100	-13.8	-3.3	17.9	4
42369	12	V	200	27/ 81	10	0	100	-16.5	2.0	21.6	2
42379	00	V	200	27/ 83	10	0	50	-7.8	5.1	15.2	1
42410	00	V	250	26/ 92	12	0	50	-14.9	-3.7	20.0	3
42410	12	V	300	26/ 92	17	0	70	-4.5	4.1	25.3	2
42724	00	V	250	24/ 91	22	0	54	-2.4	-5.6	15.8	1
42724	12	V	250	24/ 91	10	1	60	3.1	-7.7	19.8	1
44212	00	V	300	50/ 92	19	0	63	21.1	-9.0	30.7	6
47981	00	V	150	25/ 141	13	0	7	11.7	2.7	15.8	1
52681	00	V	150	39/ 103	30	0	13	-2.5	12.9	17.8	4
52681	12	V	100	39/ 103	31	0	35	-0.7	15.1	20.7	5
56691	00	V	150	27/ 104	27	0	11	-2.0	8.5	15.6	1
57749	00	V	150	28/ 110	30	0	3	-1.8	7.8	19.7	1
60360	12	V	150	37/ 8	18	0	50	-1.2	-6.5	16.9	1
60566	12	V	400	32/ 4	10	0	0	-7.1	4.1	15.3	1
60620	12	V	250	28/ 0	18	0	11	-19.3	1.8	24.6	3
61017	12	V	300	19/ 13	10	0	30	-15.3	5.7	22.3	2
62337	00	V	200	31/ 34	27	0	100	-3.9	12.0	16.9	2
62378	00	V	200	30/ 31	26	1	100	-11.2	-0.4	19.7	4
64458	12	V	150	2/ 16	18	1	16	13.5	-1.7	16.8	1
64910	12	V	150	4/ 10	10	0	20	9.4	1.7	16.6	2
72469	00	V	150	40/-105	21	0	4	-1.5	3.3	18.1	1
72520	00	V	300	40/ 80	23	0	100	16.2	9.8	31.4	8
72520	12	V	300	40/ 80	25	0	100	12.8	6.2	32.3	7

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – DECEMBER 2000

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1378

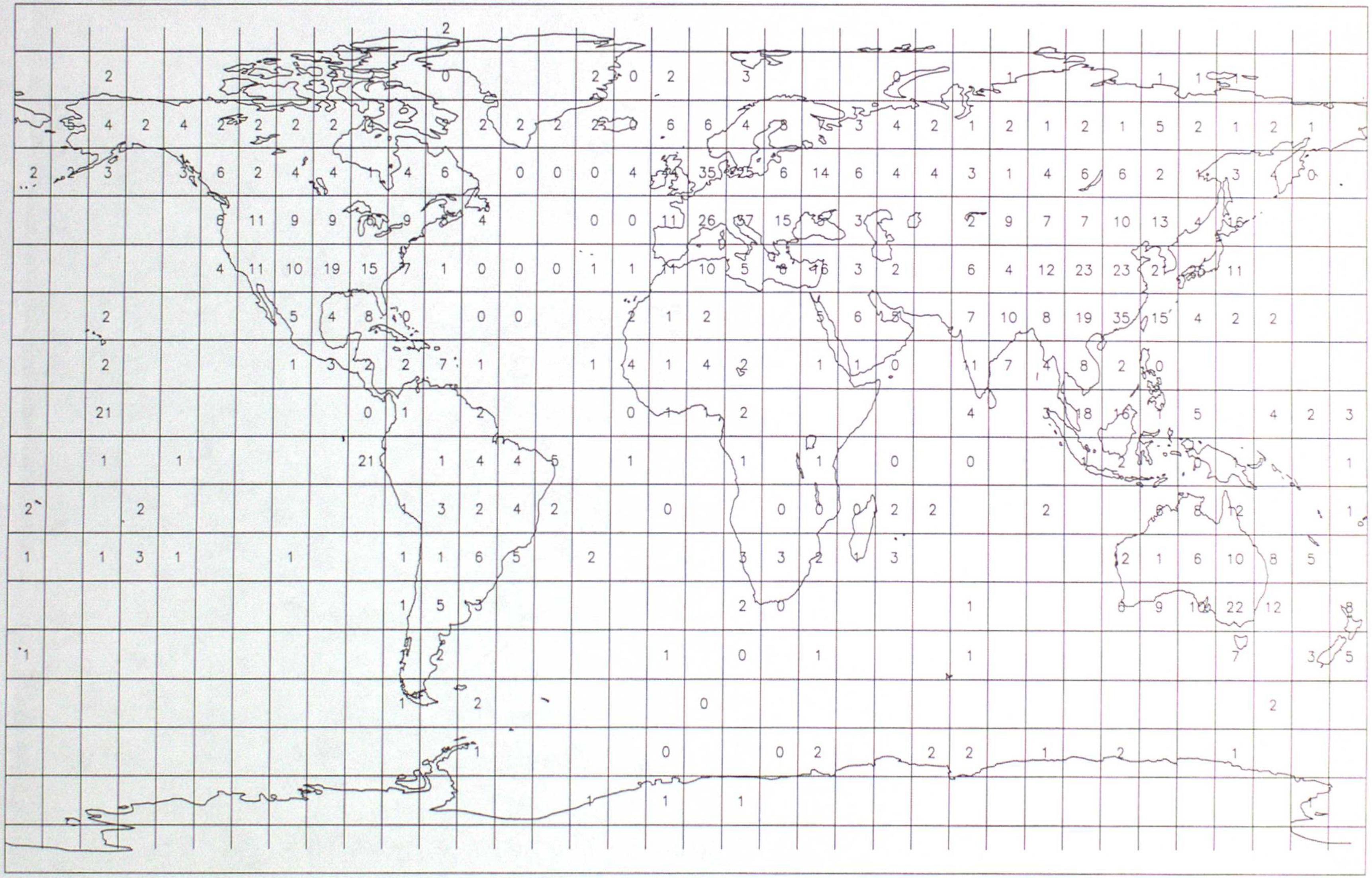

2
2 0 2 0 2 3 0 1 1 1
5 4 2 4 2 2 2 2 2 2 2 2 0 6 6 4 8 3 4 2 1 2 1 2 1 5 2 1 2 1
2 2 3 3 6 2 4 4 1 4 6 0 0 0 4 4 35 25 6 14 6 4 4 3 1 4 6 6 2 1 3 0
6 11 9 9 0 9 4 0 0 11 26 37 15 15 3 2 9 7 7 10 13 4 16
4 11 10 19 15 7 1 0 0 0 1 1 11 10 5 6 16 3 2 6 4 12 23 23 21 11
2 5 4 8 0 0 0 2 1 2 5 6 8 7 10 8 19 35 15 4 2 2
2 1 3 2 2 7 1 1 4 1 4 2 1 1 0 11 7 4 8 2 0
21 0 1 2 0 1 2 4 3 18 16 5 4 2 3
1 1 21 1 4 4 5 1 1 1 0 0 1 2 1
2 2 1 3 2 4 2 0 0 0 0 2 2 2 8 8 12 1
1 1 3 1 1 1 1 6 5 2 3 3 2 1 3 12 1 6 10 8 5
1 5 3 2 0 1 6 9 10 22 12 8
1 2 1 0 1 1 7 3 5
1 2 0 2
1 0 0 2 2 2 1 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS $\geq 10°$, with
SD $< 30°$, and
MAX SPREAD $< 10°$

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
08594	12	DD	17/ -23	22	-11.5	5.8	15.3
17240	00	DD	38/ 31	21	-11.1	3.8	11.5
17280	00	DD	38/ 40	24	-11.2	3.8	9.0
17280	12	DD	38/ 40	23	-13.9	6.6	12.3
29612	12	DD	55/ 78	29	22.7	3.1	6.0
42339	00	DD	26/ 73	20	15.0	4.3	9.9
42397	00	DD	27/ 88	14	11.1	9.6	9.6
42397	12	DD	27/ 88	13	10.9	2.3	7.8
52681	00	DD	39/ 103	29	-18.3	0.9	15.4
52681	12	DD	39/ 103	30	-20.8	1.6	17.3
60360	12	DD	37/ 8	20	16.2	8.9	15.6
62337	00	DD	31/ 34	27	-19.4	4.0	8.1
62337	12	DD	31/ 34	29	-19.2	6.9	8.6
78866	12	DD	18/ -63	21	-13.9	5.8	15.1
91366	12	DD	9/ 168	23	13.9	8.8	23.8
96749	00	DD	-6/ 107	10	-27.8	6.4	27.0

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: DECEMBER 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

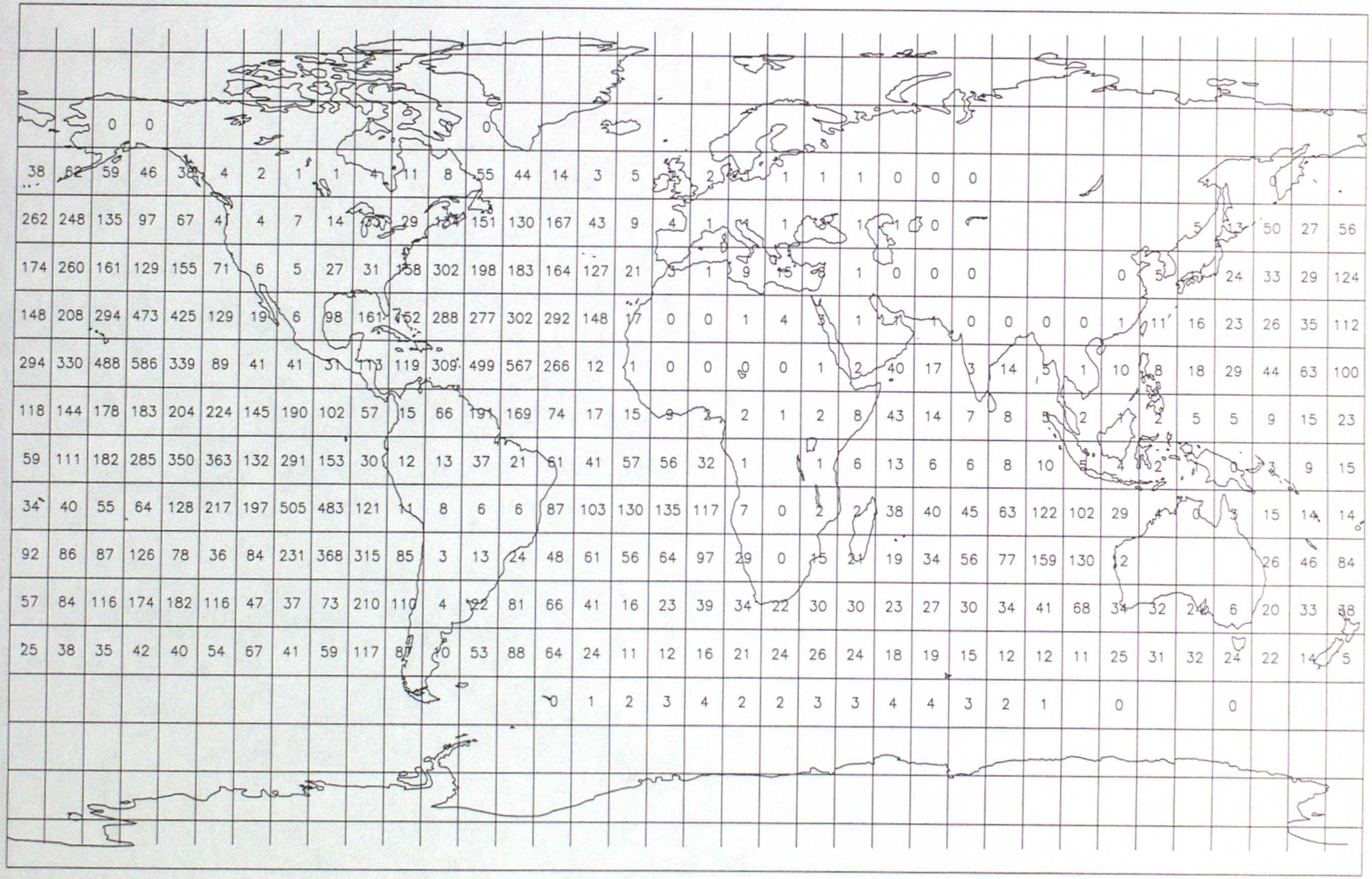
:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

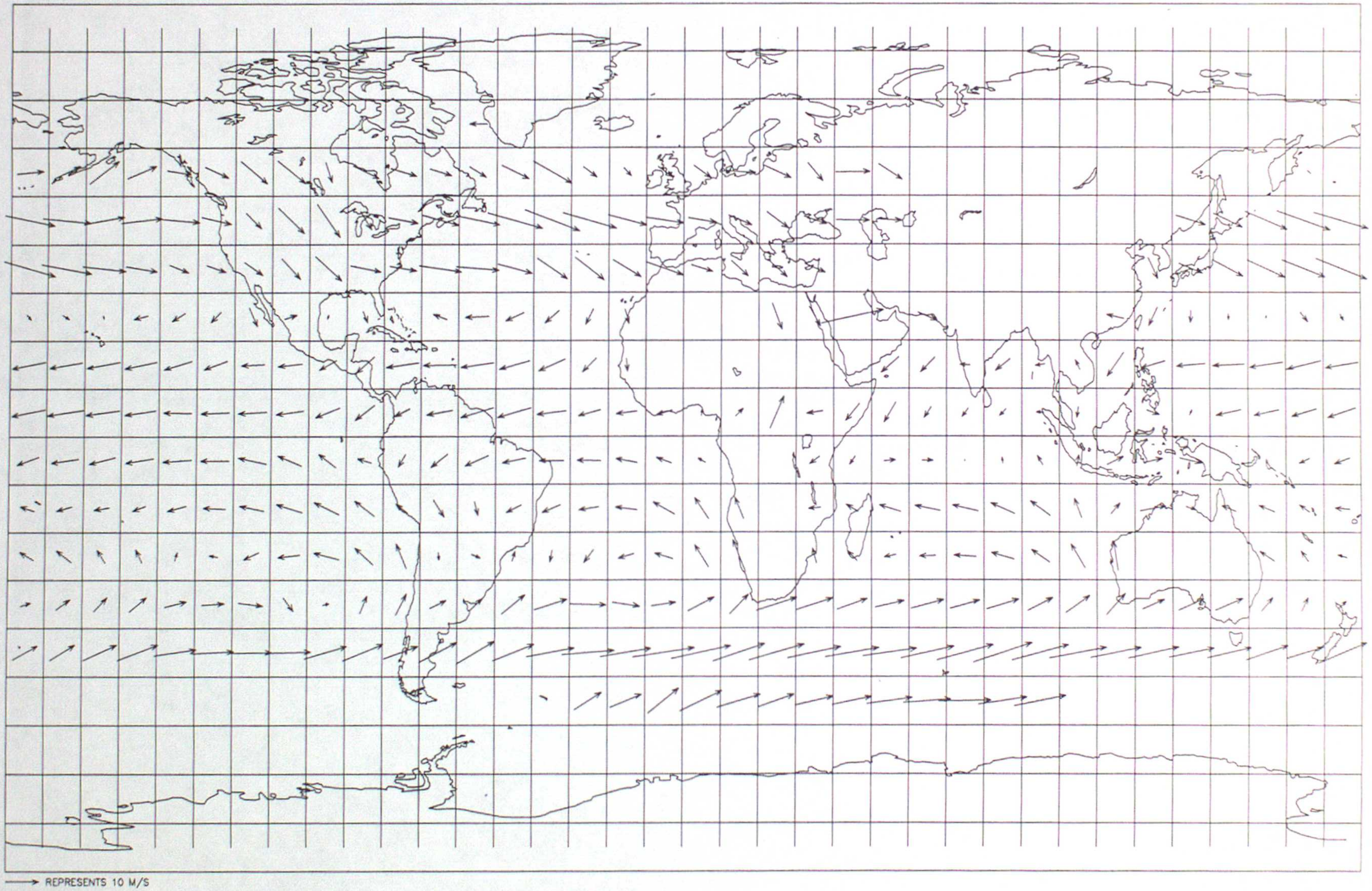
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
DECEMBER 2000

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 26240



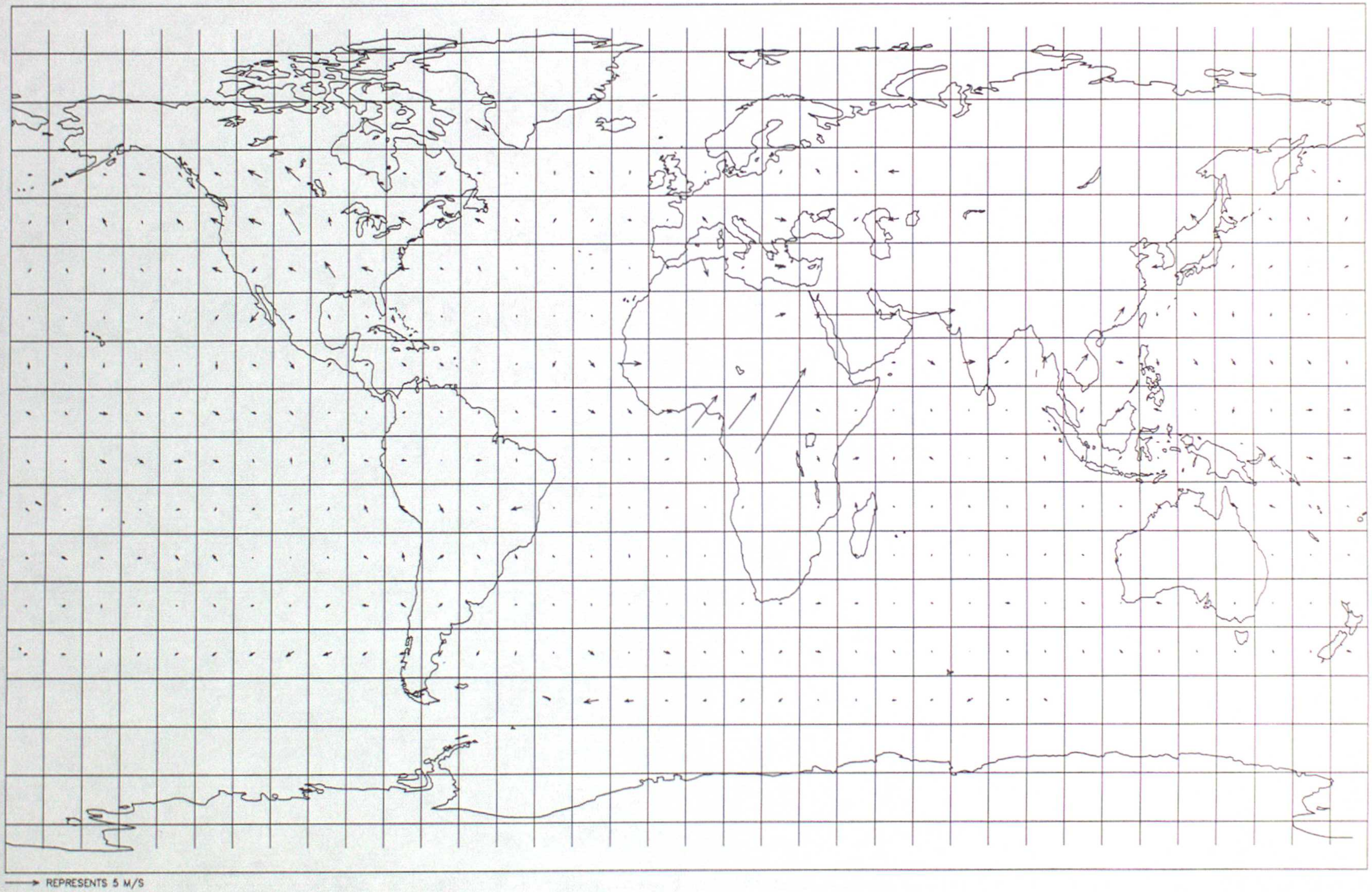
		0	0									0																							
38	62	59	46	38	4	2	1	1	4	11	8	55	44	14	3	5	2	2	1	1	1	1	0	0	0								0		
262	248	135	97	67	41	4	7	14	55	29	134	151	130	167	43	9	4	1	4	1	8	1	1	0							5	13	50	27	56
174	260	161	129	155	71	6	5	27	31	158	302	198	183	164	127	21	3	1	9	15	8	1	0	0	0				0	5	25	24	33	29	124
148	208	294	473	425	129	19	6	98	161	152	288	277	302	292	148	17	0	0	1	4	3	1	1	1	0	0	0	0	1	11	16	23	26	35	112
294	330	488	586	339	89	41	41	31	113	119	309	499	567	266	12	1	0	0	0	0	1	2	40	17	3	14	5	1	10	8	18	29	44	63	100
118	144	178	183	204	224	145	190	102	57	15	66	191	169	74	17	15	9	2	2	1	2	8	43	14	7	8	5	2	1	2	5	5	9	15	23
59	111	182	285	350	363	132	291	153	30	12	13	37	21	61	41	57	56	32	1		1	6	13	6	6	8	10	5	4	2	1	0	3	9	15
34	40	55	64	128	217	197	505	483	121	11	8	6	6	87	103	130	135	117	7	0	2	2	38	40	45	63	122	102	29	4	0	3	15	14	14
92	86	87	126	78	36	84	231	368	315	85	3	13	24	48	61	56	64	97	29	0	15	21	19	34	56	77	159	130	12				26	46	84
57	84	116	174	182	116	47	37	73	210	110	4	22	81	66	41	16	23	39	34	22	30	30	23	27	30	34	41	68	34	32	24	6	20	33	38
25	38	35	42	40	54	67	41	59	117	87	10	53	88	64	24	11	12	16	21	24	26	24	18	19	15	12	12	11	25	31	32	24	22	14	5
														0	1	2	3	4	2	2	3	3	4	4	3	2	1		0			0			

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA FIGURE 11
DECEMBER 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

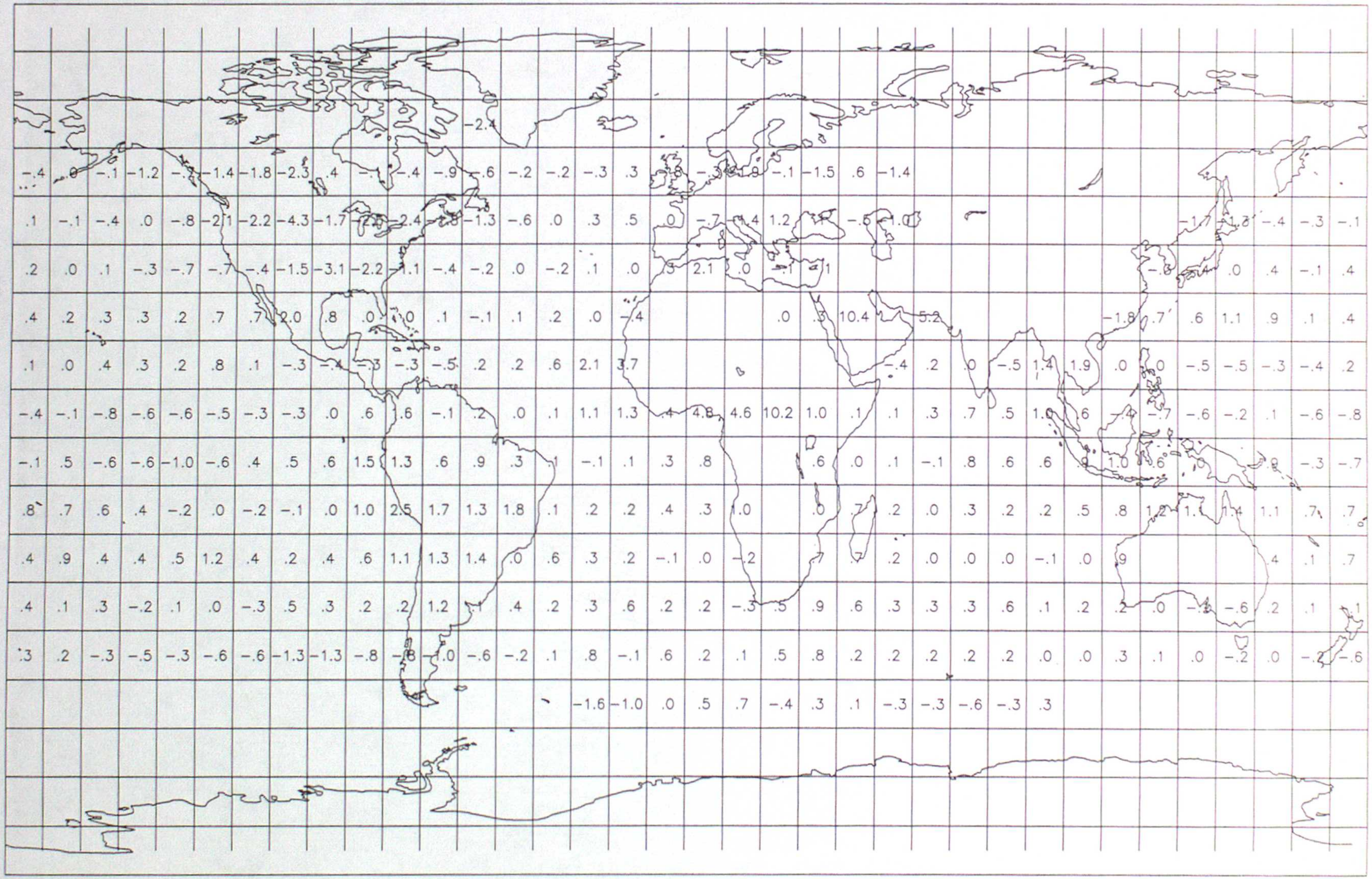

→ REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA
DECEMBER 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

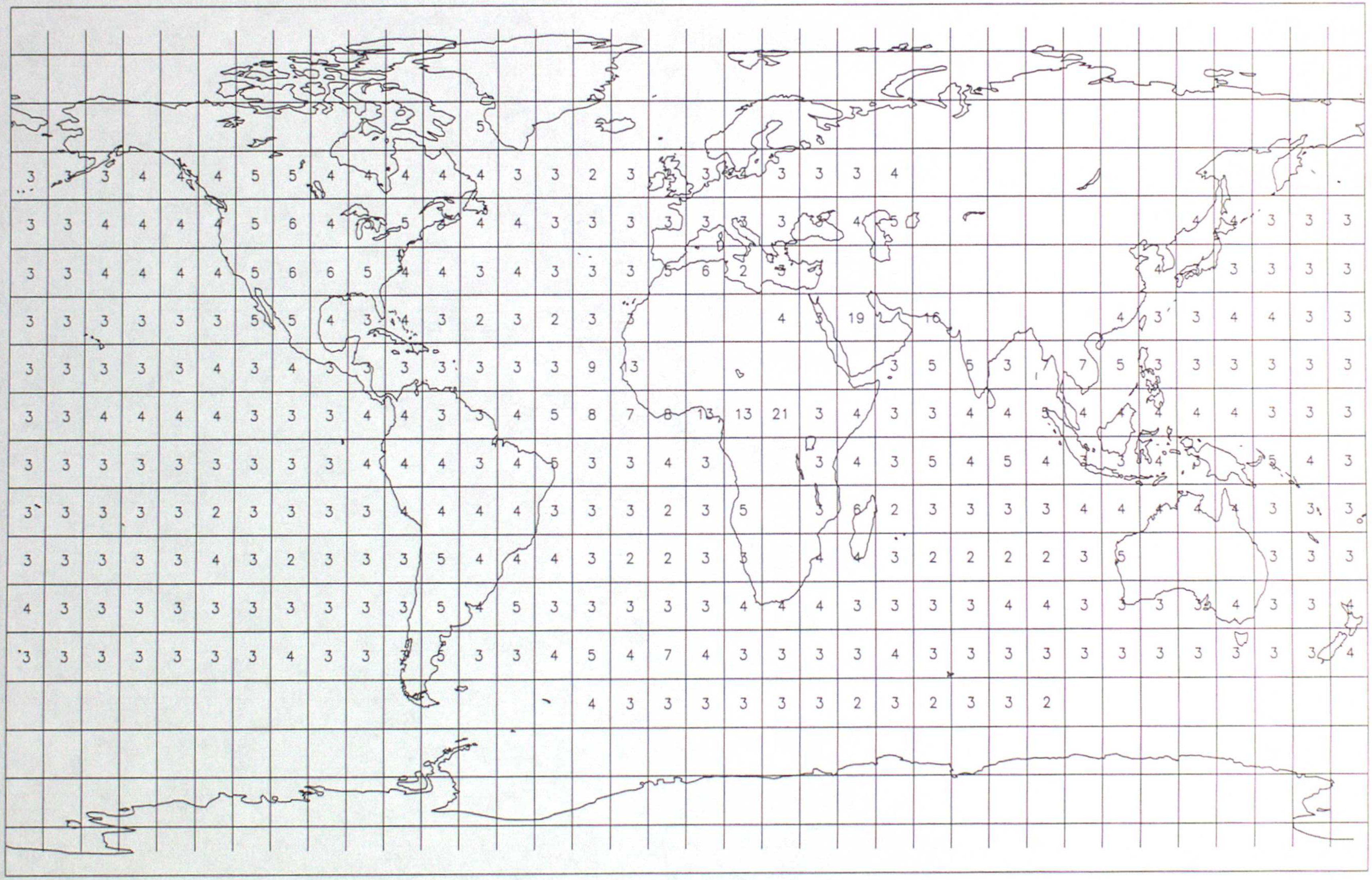
FIGURE 12



SATOBS : MEAN O−B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
DECEMBER 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-2.4
-.4 .0 -.1 -1.2 -.2 -1.4 -1.8 -2.3 .4 -.1 -.4 -.9 -.6 -.2 -.2 -.3 .3 .8 -.3 -.9 -.1 -1.5 .6 -1.4
.1 -.1 -.4 .0 -.8 -2.1 -2.2 -4.3 -1.7 -2.6 -2.4 -2.8 -1.3 -.6 .0 .3 .5 .0 -.7 -1.4 1.2 -.5 -1.0 -1.7 -1.3 -.4 -.3 -.1
.2 .0 .1 -.3 -.7 -.7 -.4 -1.5 -3.1 -2.2 -1.1 -.4 -.2 .0 -.2 .1 .0 .3 2.1 .0 -.1 .1 -.8 .4 .0 .4 -.1 .4
.4 .2 .3 .3 .2 .7 .7 2.0 .8 .0 .0 .1 -.1 .1 .2 .0 -.4 .0 .3 10.4 5.2 -1.8 .7 .6 1.1 .9 .1 .4
.1 .0 .4 .3 .2 .8 .1 -.3 -.4 -.3 -.3 -.5 .2 .2 .6 2.1 3.7 -.4 .2 .0 -.5 1.4 1.9 .0 .0 -.5 -.5 -.3 -.4 .2
-.4 -.1 -.8 -.6 -.6 -.5 -.3 -.3 .0 .6 1.6 -.1 .2 .0 .1 1.1 1.3 .4 4.8 4.6 10.2 1.0 .1 .1 .3 .7 .5 1.0 .6 -.4 -.7 -.6 -.2 .1 -.6 -.8
-.1 .5 -.6 -.6 -1.0 -.6 .4 .5 .6 1.5 1.3 .6 .9 .3 .1 -.1 .1 .3 .8 .6 .0 .1 -.1 .8 .6 .6 .9 1.0 .6 .8 -.3 -.7
.8 .7 .6 .4 -.2 .0 -.2 -.1 .0 1.0 2.5 1.7 1.3 1.8 .1 .2 .2 .4 .3 1.0 .0 .7 .2 .0 .3 .2 .2 .5 .8 1.2 1.1 1.4 1.1 .7 .7
.4 .9 .4 .4 .5 1.2 .4 .2 .4 .6 1.1 1.3 1.4 .0 .6 .3 .2 -.1 .0 -.2 .7 .7 .2 .0 .0 .0 -.1 .0 .9 .4 .1 .7
.4 .1 .3 -.2 .1 .0 -.3 .5 .3 .2 .2 1.2 .1 .4 .2 .3 .6 .2 .2 -.3 .5 .9 .6 .3 .3 .3 .6 .1 .2 .2 .0 -.4 -.6 .2 .1 .1
.3 .2 -.3 -.5 -.3 -.6 -.6 -1.3 -1.3 -.8 -.8 -1.0 -.6 -.2 .1 .8 -.1 .6 .2 .1 .5 .8 .2 .2 .2 .2 .2 .0 .0 .3 .1 .0 -.2 .0 -.2 -.6
-1.6 -1.0 .0 .5 .7 -.4 .3 .1 -.3 -.3 -.6 -.3 .3

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
DECEMBER 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
DECEMBER 2000

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 7283

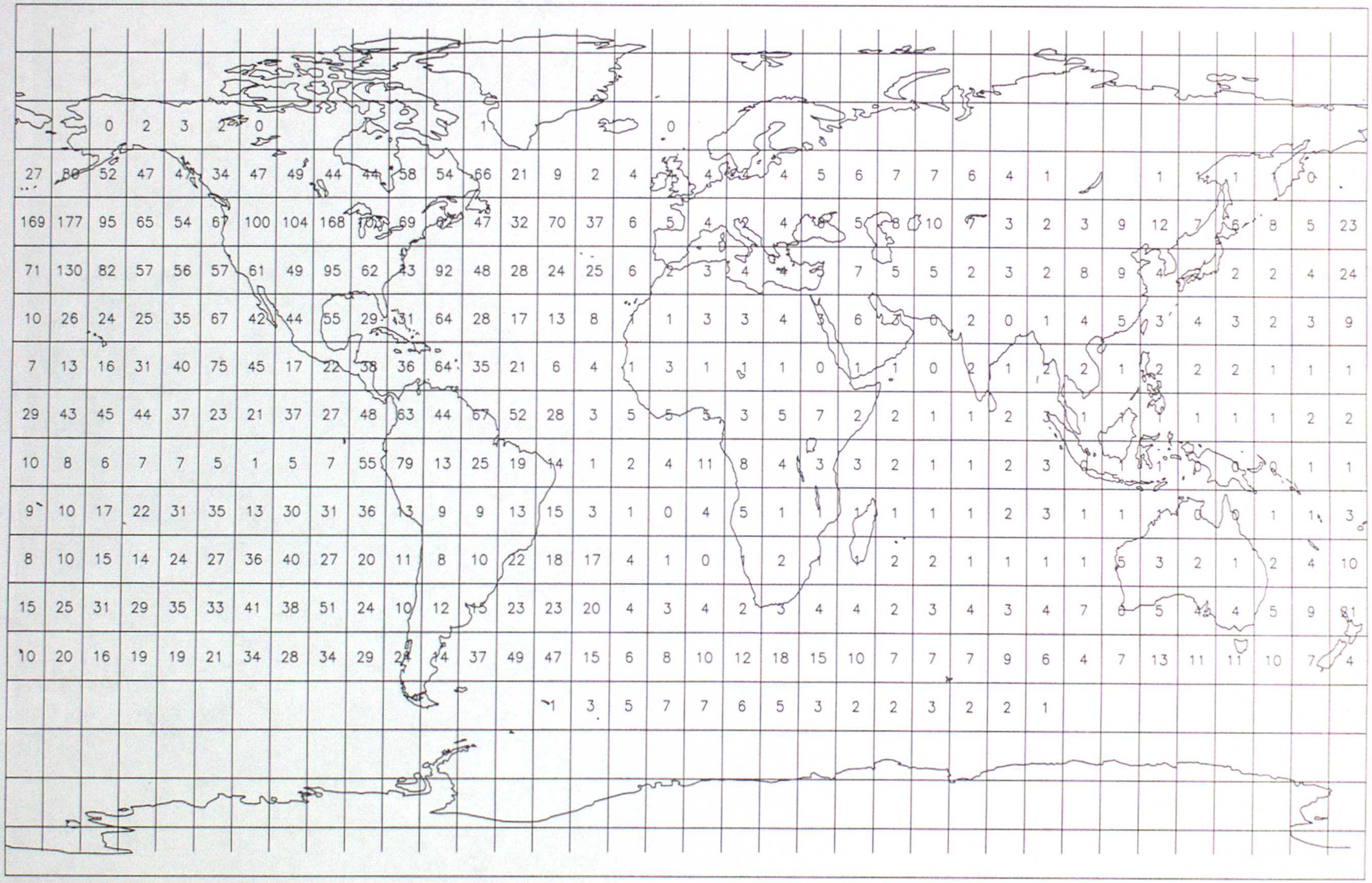
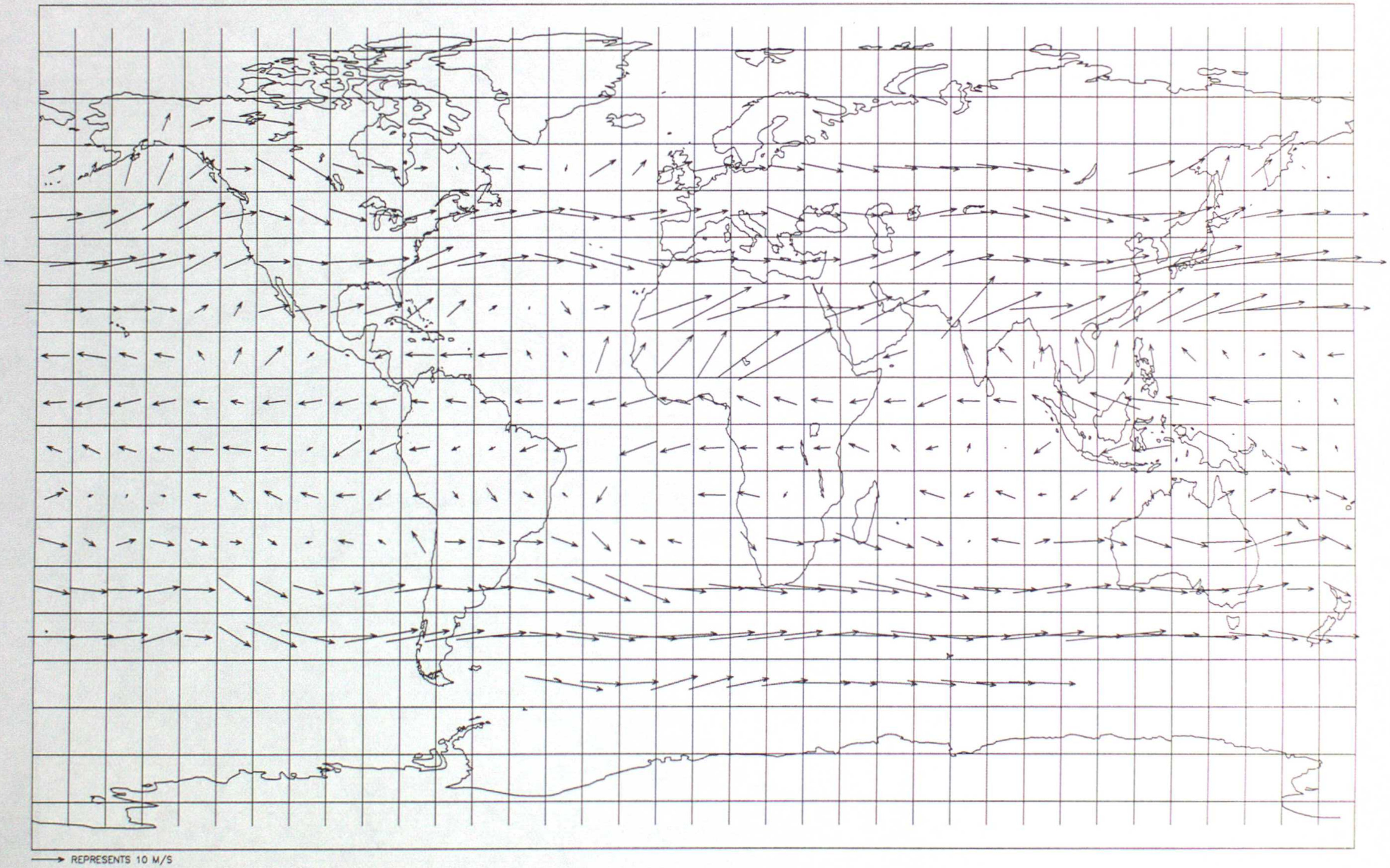

0 2 3 2 0 1 0
27 80 52 47 47 34 47 49 44 44 58 54 66 21 9 2 4 4 4 4 4 5 6 7 7 6 4 1 1 1 1 1 0
169 177 95 65 54 67 100 104 168 103 69 62 47 32 70 37 6 5 4 2 4 8 5 8 10 7 3 2 3 9 12 7 6 8 5 23
71 130 82 57 56 57 61 49 95 62 43 92 48 28 24 25 6 2 3 4 4 5 7 5 5 2 3 2 8 9 4 2 2 4 24
10 26 24 25 35 67 42 44 55 29 31 64 28 17 13 8 1 1 3 3 4 3 6 3 0 2 0 1 4 5 3 4 3 2 3 9
7 13 16 31 40 75 45 17 22 38 36 64 35 21 6 4 1 3 1 1 1 0 1 1 0 2 1 2 2 1 2 2 2 1 1 1
29 43 45 44 37 23 21 37 27 48 63 44 67 52 28 3 5 5 5 3 5 7 2 2 1 1 2 3 1 1 1 1 1 1 2 2
10 8 6 7 7 5 1 5 7 55 79 13 25 19 14 1 2 4 11 8 4 3 3 2 1 1 2 3 0 1 1 0 0 0 1 1
9 10 17 22 31 35 13 30 31 36 13 9 9 13 15 3 1 0 4 5 1 1 1 1 1 1 2 3 1 1 1 0 0 1 1 3
8 10 15 14 24 27 36 40 27 20 11 8 10 22 18 17 4 1 0 1 2 1 1 2 2 1 1 1 1 5 3 2 1 2 4 10
15 25 31 29 35 33 41 38 51 24 10 12 15 23 23 20 4 3 4 2 3 4 4 2 3 4 3 4 7 6 5 4 4 5 9 81
10 20 16 19 19 21 34 28 34 29 24 14 37 49 47 15 6 8 10 12 18 15 10 7 7 7 9 6 4 7 13 11 11 10 7 4
1 3 5 7 7 6 5 3 2 2 3 2 2 1

FIGURE 16

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
DECEMBER 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

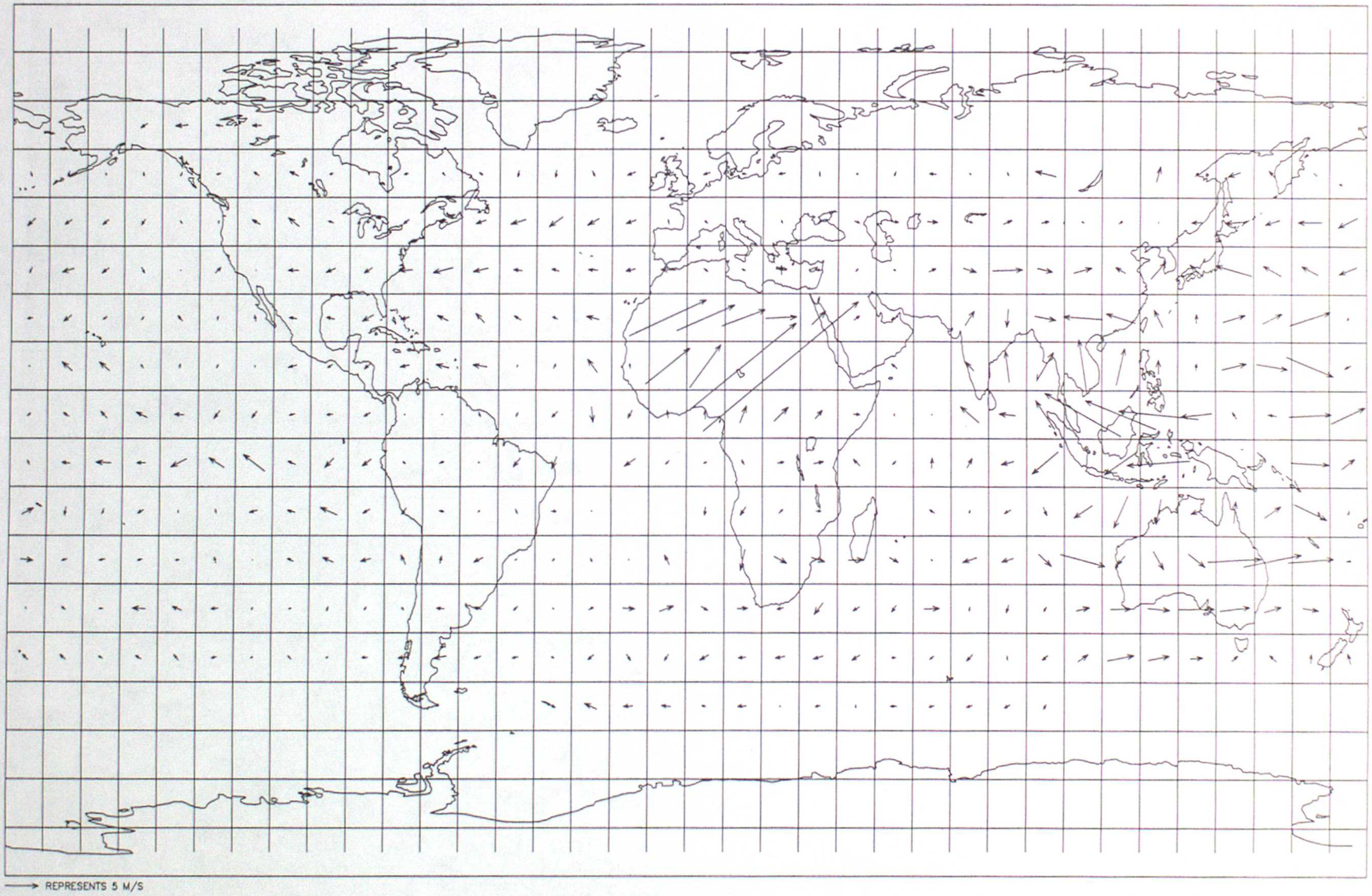
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

DECEMBER 2000

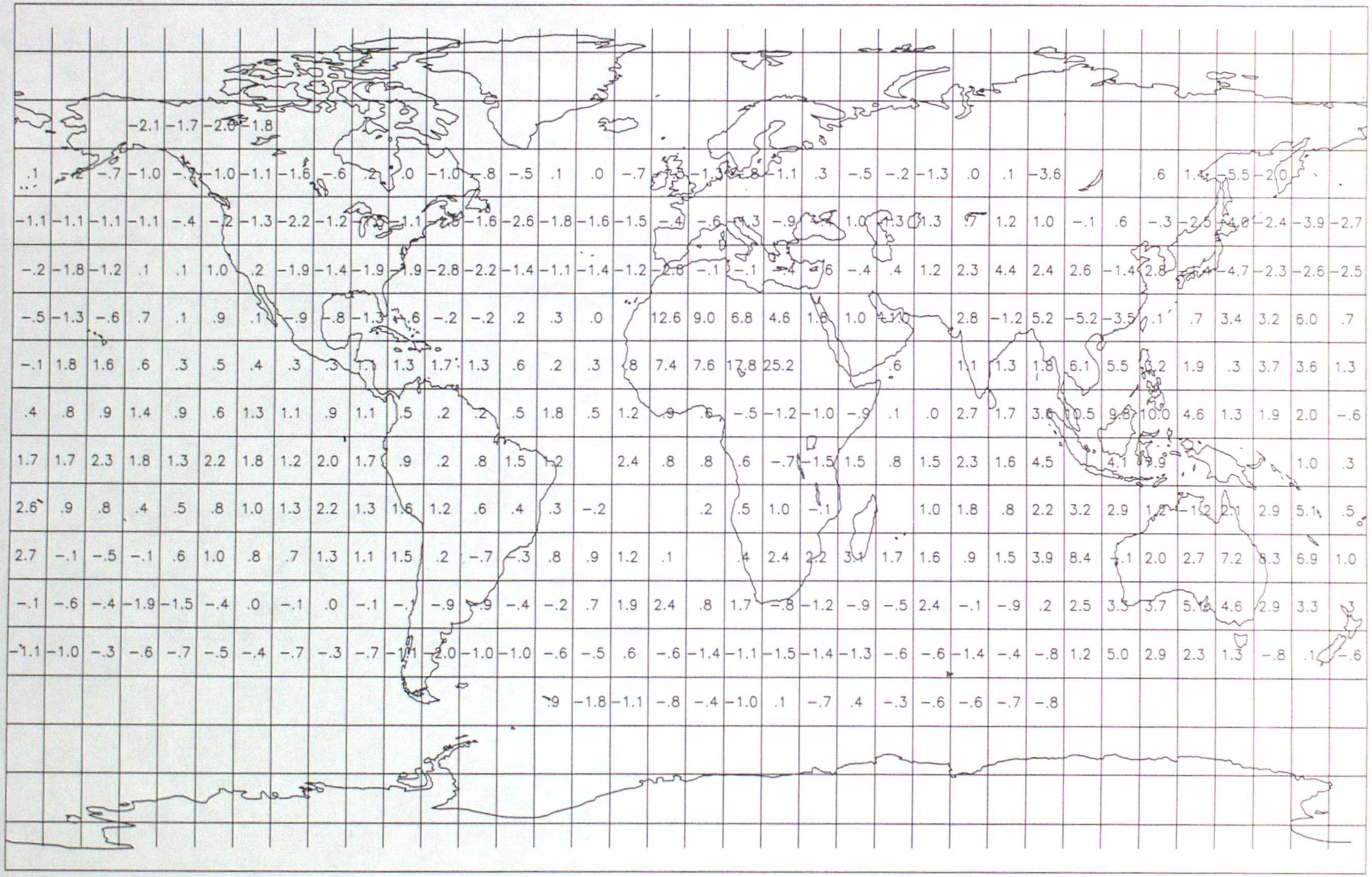
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

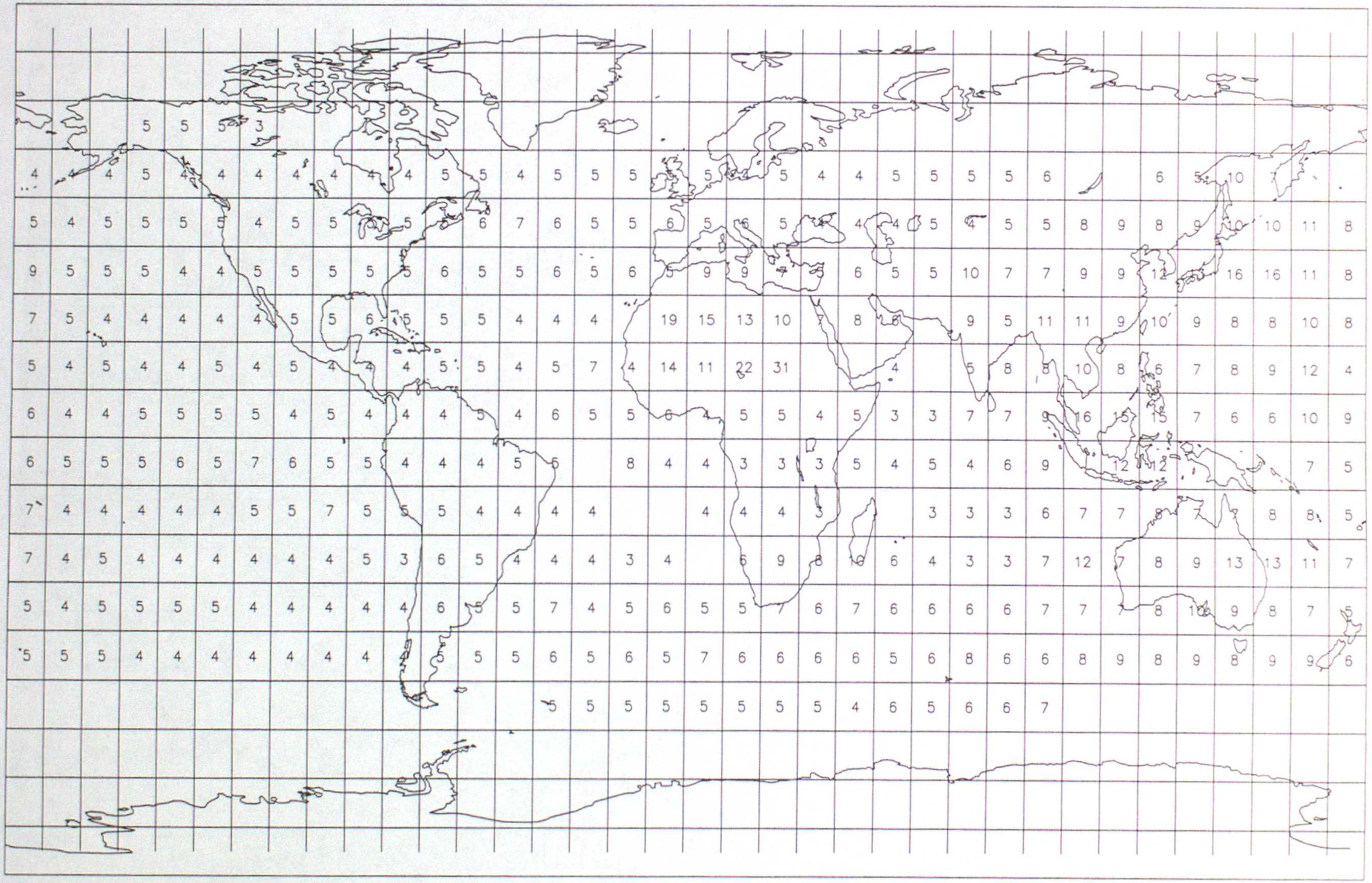
FIGURE 17



SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
DECEMBER 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

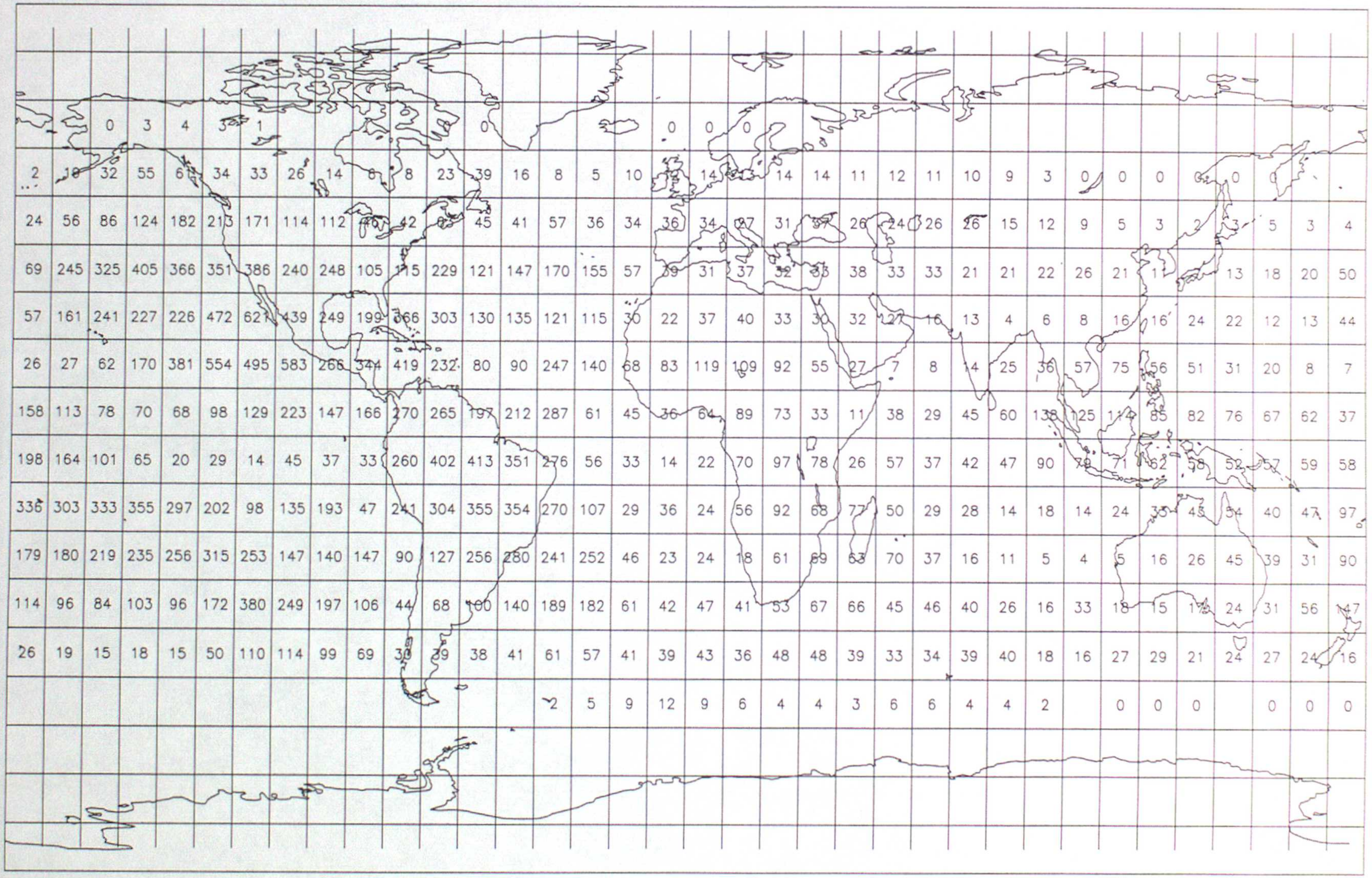

-2.1 -1.7 -2.0 -1.8
.1 -.2 -.7 -1.0 -.7 -1.0 -1.1 -1.6 -.6 .2 .0 -1.0 -.8 -.5 .1 .0 -.7 -1.5 -1.3 -.8 -1.1 .3 -.5 -.2 -1.3 .0 .1 -3.6 .6 1.4 -5.5 -2.0
-1.1 -1.1 -1.1 -1.1 -.4 -.2 -1.3 -2.2 -1.2 -1.0 -1.1 -2.5 -1.6 -2.6 -1.8 -1.6 -1.5 -.4 -.6 -1.3 -.9 -.4 1.0 -1.3 1.3 .7 1.2 1.0 -.1 .6 -.3 -2.5 -4.0 -2.4 -3.9 -2.7
-.2 -1.8 -1.2 .1 .1 1.0 .2 -1.9 -1.4 -1.9 -1.9 -2.8 -2.2 -1.4 -1.1 -1.4 -1.2 -2.8 -.1 -.1 -.4 .6 -.4 .4 1.2 2.3 4.4 2.4 2.6 -1.4 2.8 -.4 -4.7 -2.3 -2.6 -2.5
-.5 -1.3 -.6 .7 .1 .9 .1 -.9 -.8 -1.3 -.6 -.2 -.2 .2 .3 .0 12.6 9.0 6.8 4.6 1.8 1.0 -1.0 2.8 -1.2 5.2 -5.2 -3.5 .1 .7 3.4 3.2 6.0 .7
-.1 1.8 1.6 .6 .3 .5 .4 .3 .3 1.1 1.3 1.7 1.3 .6 .2 .3 .8 7.4 7.6 17.8 25.2 .6 1.1 1.3 1.8 6.1 5.5 3.2 1.9 .3 3.7 3.6 1.3
.4 .8 .9 1.4 .9 .6 1.3 1.1 .9 1.1 .5 .2 .2 .5 1.8 .5 1.2 .9 .6 -.5 -1.2 -1.0 -.9 .1 .0 2.7 1.7 3.6 10.5 9.8 10.0 4.6 1.3 1.9 2.0 -.6
1.7 1.7 2.3 1.8 1.3 2.2 1.8 1.2 2.0 1.7 .9 .2 .8 1.5 1.2 2.4 .8 .8 .6 -.7 -1.5 1.5 .8 1.5 2.3 1.6 4.5 4.1 7.9 1.0 .3
2.6 .9 .8 .4 .5 .8 1.0 1.3 2.2 1.3 1.6 1.2 .6 .4 .3 -.2 .2 .5 1.0 -.1 1.0 1.8 .8 2.2 3.2 2.9 1.2 -1.2 2.1 2.9 5.1 .5
2.7 -.1 -.5 -.1 .6 1.0 .8 .7 1.3 1.1 1.5 .2 -.7 -.3 .8 .9 1.2 .1 .4 2.4 2.2 3.1 1.7 1.6 .9 1.5 3.9 8.4 -.1 2.0 2.7 7.2 8.3 6.9 1.0
-.1 -.6 -.4 -1.9 -1.5 -.4 .0 -.1 .0 -.1 -.1 -.9 -.9 -.4 -.2 .7 1.9 2.4 .8 1.7 -.8 -1.2 -.9 -.5 2.4 -.1 -.9 .2 2.5 3.3 3.7 5.1 4.6 2.9 3.3 .3
-1.1 -1.0 -.3 -.6 -.7 -.5 -.4 -.7 -.3 -.7 -1.1 -2.0 -1.0 -1.0 -.6 -.5 .6 -.6 -1.4 -1.1 -1.5 -1.4 -1.3 -.6 -.6 -1.4 -.4 -.8 1.2 5.0 2.9 2.3 1.3 -.8 .1 -.6
.9 -1.8 -1.1 -.8 -.4 -1.0 .1 -.7 .4 -.3 -.6 -.6 -.7 -.8

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
DECEMBER 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
DECEMBER 2000

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 37083

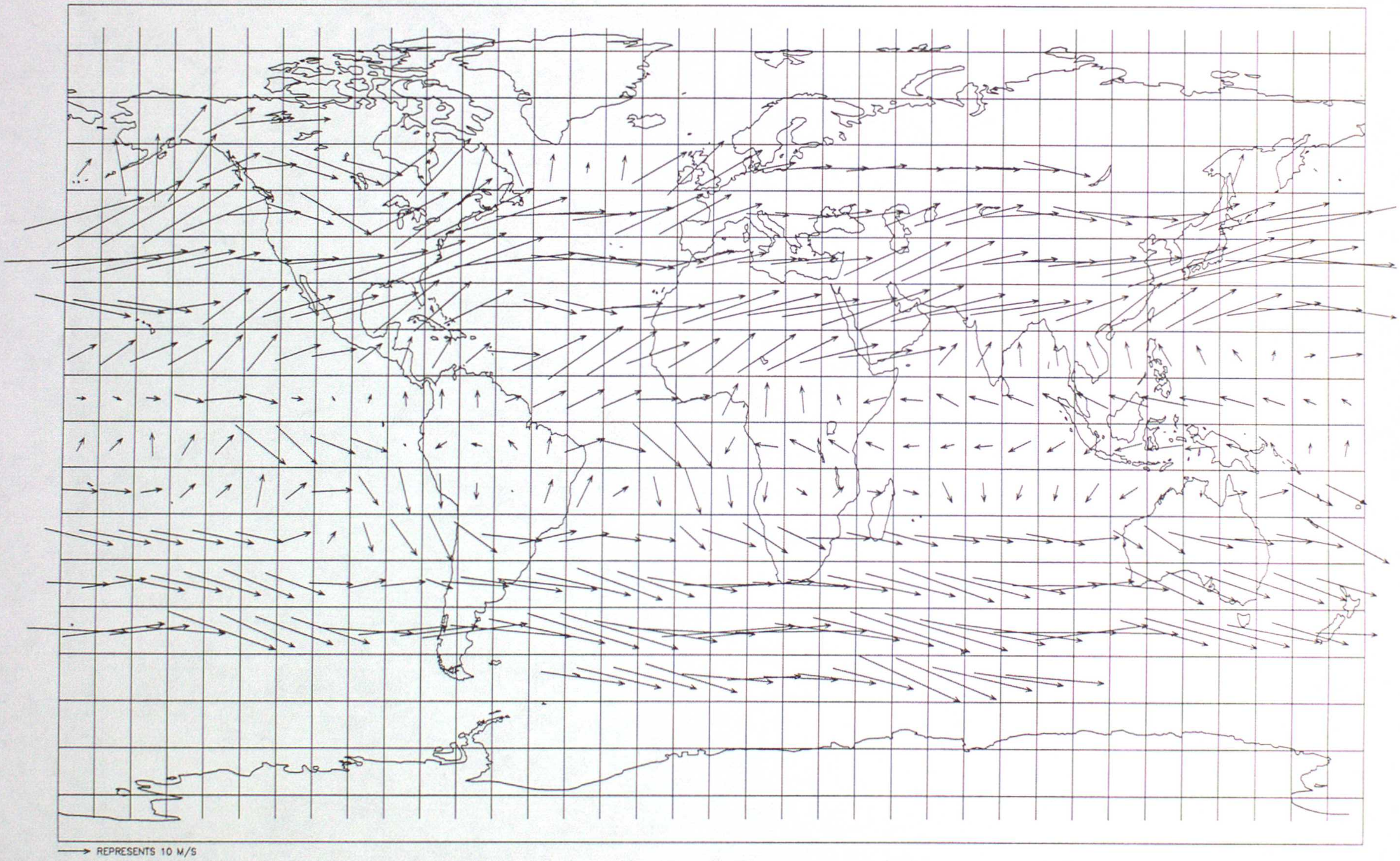

0 3 4 3 1 0 0 0 0 0
2 10 32 55 61 34 33 26 14 6 8 23 39 16 8 5 10 12 14 13 14 14 11 12 11 10 9 3 0 0 0 0 0 0
24 56 86 124 182 213 171 114 112 46 42 63 45 41 57 36 34 36 34 27 31 37 26 24 26 26 15 12 9 5 3 2 3 5 3 4
69 245 325 405 366 351 386 240 248 105 115 229 121 147 170 155 57 39 31 37 32 33 38 33 33 21 21 22 26 21 11 13 18 20 50
57 161 241 227 226 472 621 439 249 199 366 303 130 135 121 115 30 22 37 40 33 30 32 27 16 13 4 6 8 16 16 24 22 12 13 44
26 27 62 170 381 554 495 583 266 344 419 232 80 90 247 140 68 83 119 109 92 55 27 7 8 14 25 36 57 75 56 51 31 20 8 7
158 113 78 70 68 98 129 223 147 166 270 265 197 212 287 61 45 36 64 89 73 33 11 38 29 45 60 138 125 114 85 82 76 67 62 37
198 164 101 65 20 29 14 45 37 33 260 402 413 351 276 56 33 14 22 70 97 78 26 57 37 42 47 90 79 71 62 58 52 57 59 58
336 303 333 355 297 202 98 135 193 47 241 304 355 354 270 107 29 36 24 56 92 68 77 50 29 28 14 18 14 24 35 45 54 40 47 97
179 180 219 235 256 315 253 147 140 147 90 127 256 280 241 252 46 23 24 18 61 69 63 70 37 16 11 5 4 5 16 26 45 39 31 90
114 96 84 103 96 172 380 249 197 106 44 68 100 140 189 182 61 42 47 41 53 67 66 45 46 40 26 16 33 18 15 17 24 31 56 147
26 19 15 18 15 50 110 114 99 69 30 39 38 41 61 57 41 39 43 36 48 48 39 33 34 39 40 18 16 27 29 21 24 27 24 16
2 5 9 12 9 6 4 4 3 6 6 4 4 2 0 0 0 0 0 0

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101–400 HPA FIGURE 21

DECEMBER 2000

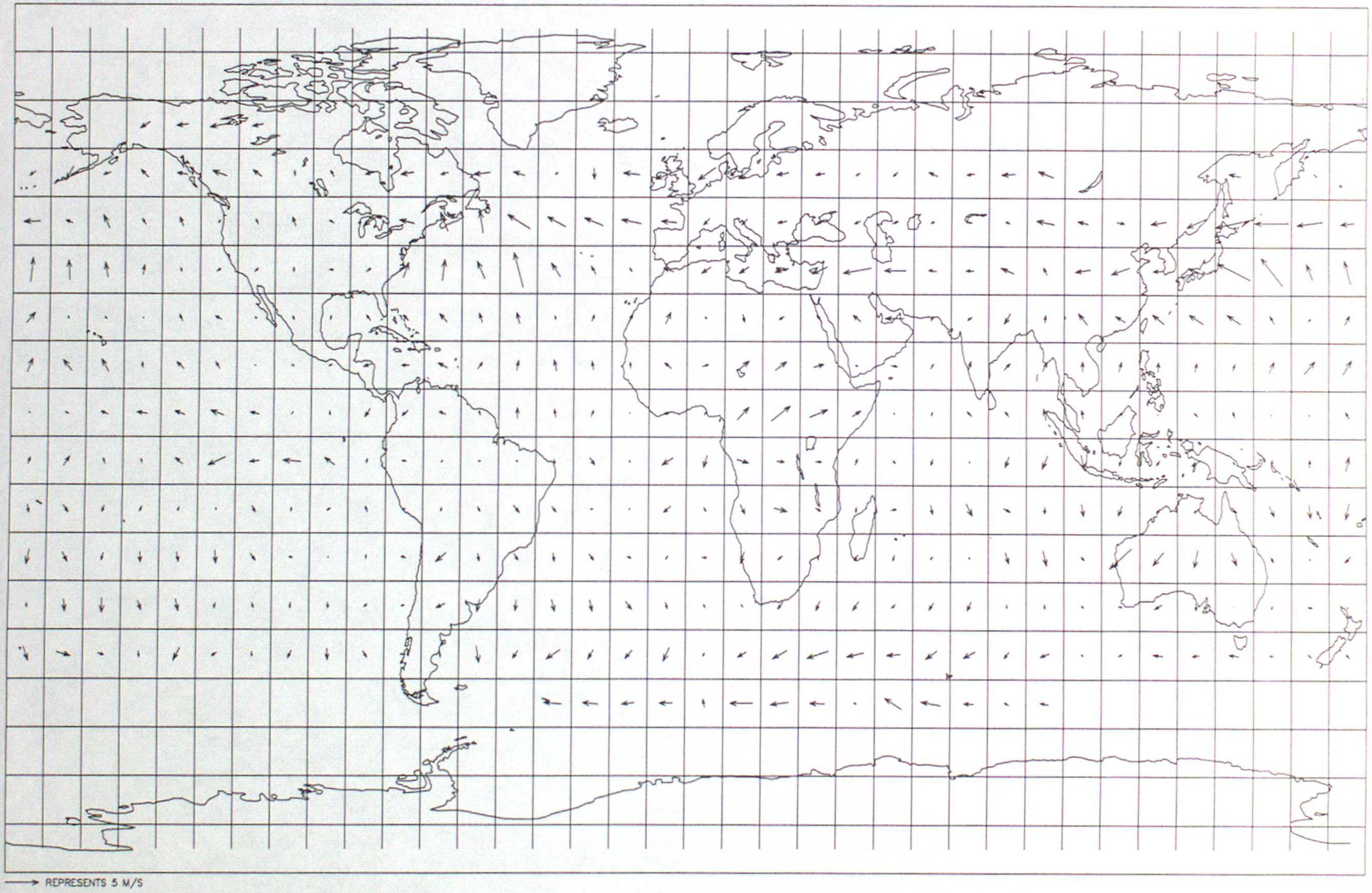
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

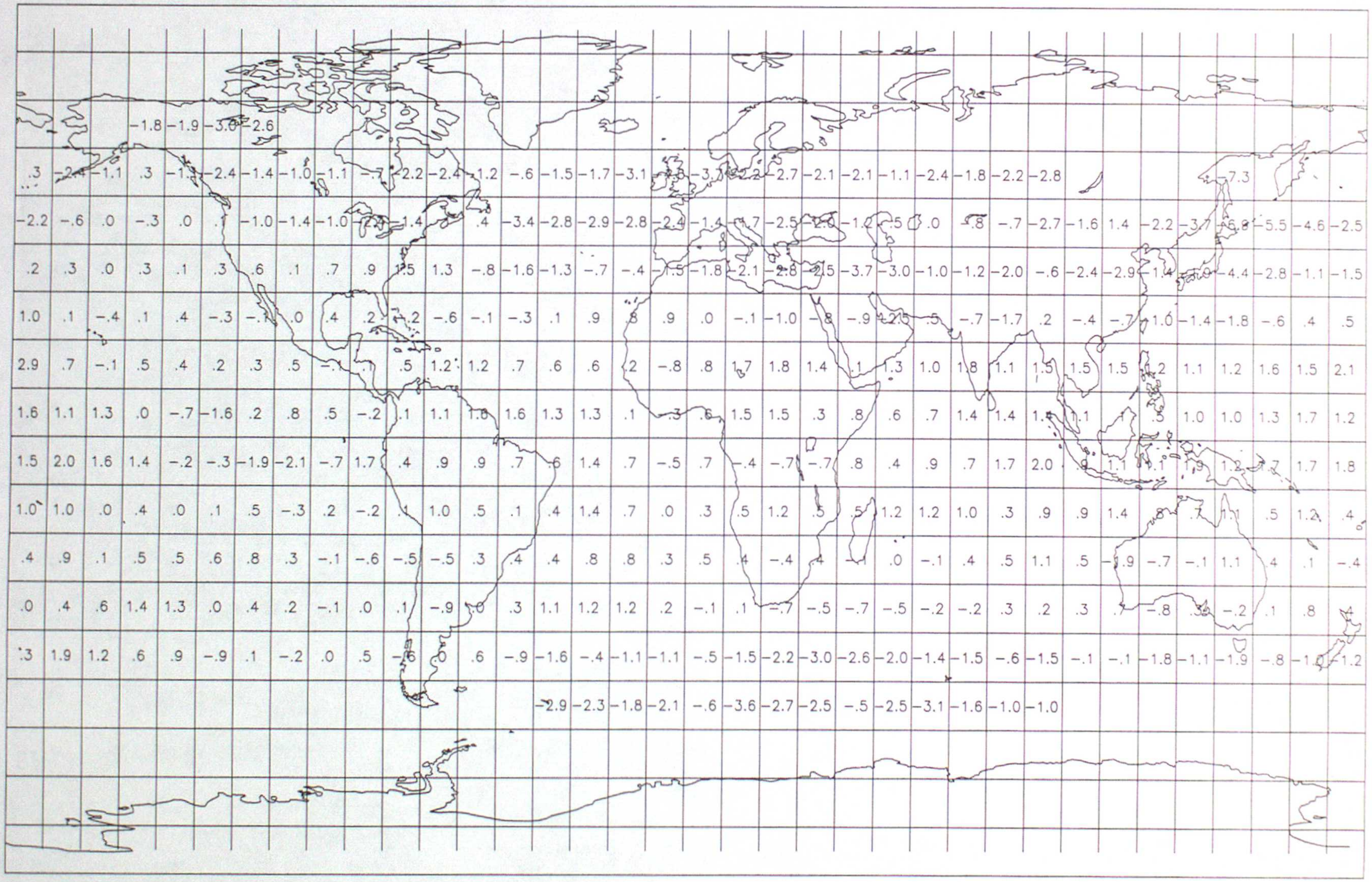

REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA
DECEMBER 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 22

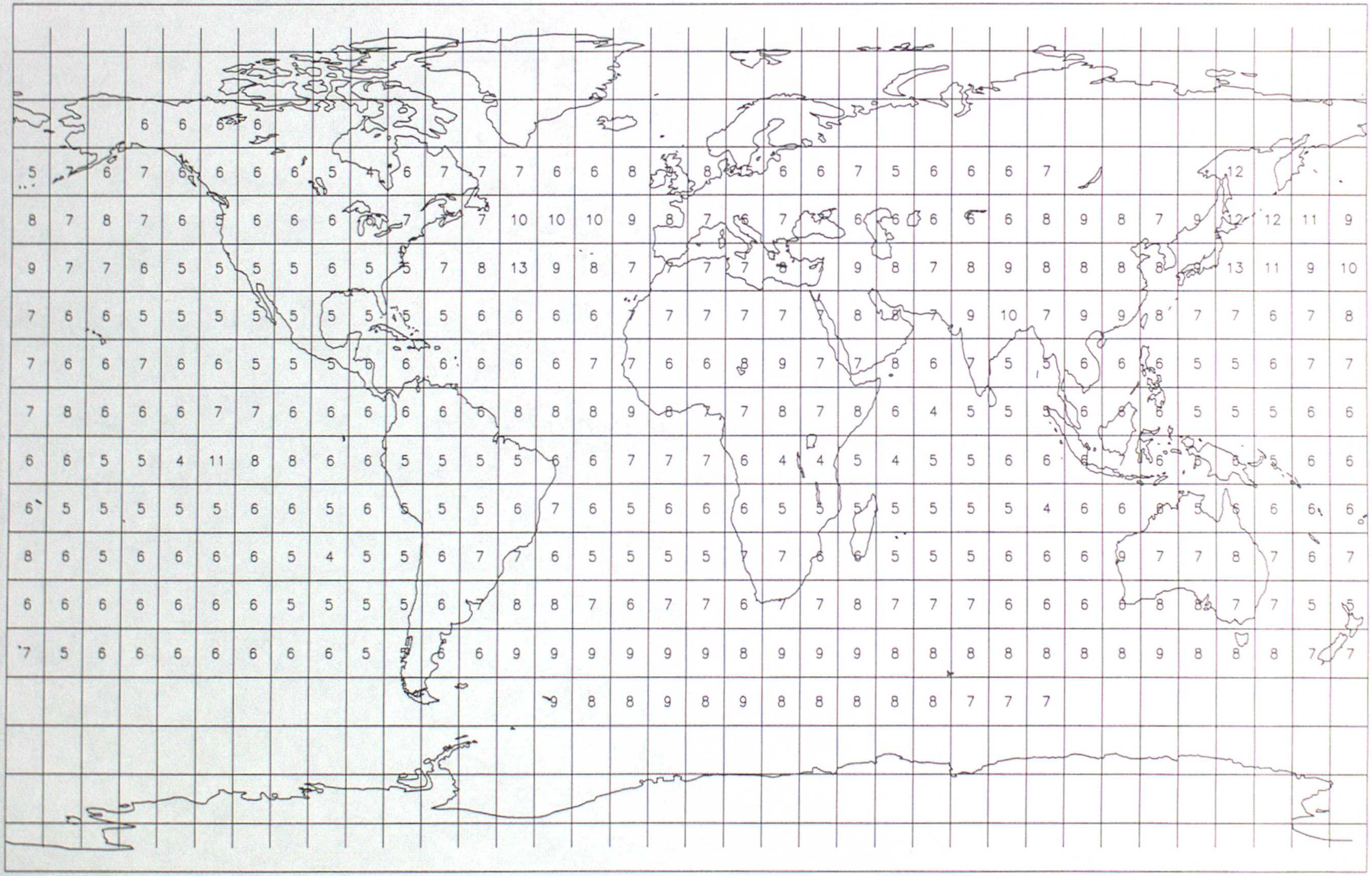


SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
DECEMBER 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



			−1.8	−1.9	−3.0	−2.6																													
.3	−2.4	−1.1	.3	−1.3	−2.4	−1.4	−1.0	−1.1	−.7	−2.2	−2.4	−1.2	−.6	−1.5	−1.7	−3.1	[illegible]	−3.7	−2.2	−2.7	−2.1	−2.1	−1.1	−2.4	−1.8	−2.2	−2.8					−7.3			
−2.2	−.6	.0	−.3	.0	.1	−1.0	−1.4	−1.0	−2.3	−1.4		.4	−3.4	−2.8	−2.9	−2.8	−2.4	−1.4	−1.7	−2.5	−2.0	−1.2	−.5	.0	−.8	−.7	−2.7	−1.6	1.4	−2.2	−3.7	−6.8	−5.5	−4.6	−2.5
.2	.3	.0	.3	.1	.3	.6	.1	.7	.9	1.5	1.3	−.8	−1.6	−1.3	−.7	−.4	−1.5	−1.8	−2.1	−2.8	−2.5	−3.7	−3.0	−1.0	−1.2	−2.0	−.6	−2.4	−2.9	−1.4	−1.0	−4.4	−2.8	−1.1	−1.5
1.0	.1	−.4	.1	.4	−.3	−.1	.0	.4	.2	−.2	−.6	−.1	−.3	.1	.9	.8	.9	.0	−.1	−1.0	−.8	−.9	−2.5	.5	−.7	−1.7	.2	−.4	−.7	−1.0	−1.4	−1.8	−.6	.4	.5
2.9	.7	−.1	.5	.4	.2	.3	.5	−.1	.1	.5	1.2	1.2	.7	.6	.6	.2	−.8	.8	1.7	1.8	1.4	.1	1.3	1.0	1.8	1.1	1.5	1.5	1.5	1.2	1.1	1.2	1.6	1.5	2.1
1.6	1.1	1.3	.0	−.7	−1.6	.2	.8	.5	−.2	.1	1.1	1.8	1.6	1.3	1.3	.1	−.3	.6	1.5	1.5	.3	.8	.6	.7	1.4	1.4	1.4	1.1	.1	.5	1.0	1.0	1.3	1.7	1.2
1.5	2.0	1.6	1.4	−.2	−.3	−1.9	−2.1	−.7	1.7	.4	.9	.9	.7	.6	1.4	.7	−.5	.7	−.4	−.7	−.7	.8	.4	.9	.7	1.7	2.0	.9	1.1	.1	1.9	1.2	.7	1.7	1.8
1.0	1.0	.0	.4	.0	.1	.5	−.3	.2	−.2	.1	1.0	.5	.1	.4	1.4	.7	.0	.3	.5	1.2	.5	.5	1.2	1.2	1.0	.3	.9	.9	1.4	.8	.7	1.1	.5	1.2	.4
.4	.9	.1	.5	.5	.6	.8	.3	−.1	−.6	−.5	−.5	.3	.4	.4	.8	.8	.3	.5	.4	−.4	.4	−.1	.0	−.1	.4	.5	1.1	.5	−1.9	−.7	−.1	1.1	.4	.1	−.4
.0	.4	.6	1.4	1.3	.0	.4	.2	−.1	.0	.1	−.9	.0	.3	1.1	1.2	1.2	.2	−.1	.1	−.7	−.5	−.7	−.5	−.2	−.2	.3	.2	.3	.7	−.8	.3	−.2	.1	.8	.4
.3	1.9	1.2	.6	.9	−.9	.1	−.2	.0	.5	−.6	.0	.6	−.9	−1.6	−.4	−1.1	−1.1	−.5	−1.5	−2.2	−3.0	−2.6	−2.0	−1.4	−1.5	−.6	−1.5	−.1	−.1	−1.8	−1.1	−1.9	−.8	−1.0	−1.2
														−2.9	−2.3	−1.8	−2.1	−.6	−3.6	−2.7	−2.5	−.5	−2.5	−3.1	−1.6	−1.0	−1.0								

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
DECEMBER 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



			6	6	6	6																													
5	7	6	7	6	6	6	6	5	4	6	7	7	7	6	6	8	8	8	5	6	6	7	5	6	6	6	7					12			
8	7	8	7	6	5	6	6	6	6	7	7	7	10	10	10	9	8	7	6	7	7	6	6	6	6	6	8	9	8	7	9	12	12	11	9
9	7	7	6	5	5	5	5	6	5	5	7	8	13	9	8	7	7	7	7	8	7	9	8	7	8	9	8	8	8	8	9	13	11	9	10
7	6	6	5	5	5	5	5	5	5	5	5	6	6	6	6	7	7	7	7	7	7	8	8	7	9	10	7	9	9	8	7	7	6	7	8
7	6	6	7	6	6	5	5	5	6	6	6	6	6	6	7	7	6	6	8	9	7	7	8	6	7	5	5	6	6	6	5	5	6	7	7
7	8	6	6	6	7	7	6	6	6	6	6	6	8	8	8	9	8	7	7	8	7	8	6	4	5	5	5	6	8	6	5	5	5	6	6
6	6	5	5	4	11	8	8	6	6	5	5	5	5	6	6	7	7	7	6	4	4	5	4	5	5	6	6	6	7	6	6	6	5	6	6
6	5	5	5	5	5	6	6	5	6	5	5	5	6	7	6	5	6	6	6	5	5	5	5	5	5	5	4	6	6	6	5	6	6	6	6
8	6	5	6	6	6	6	5	4	5	5	6	7	7	6	5	5	5	5	7	7	6	6	5	5	5	6	6	6	9	7	7	8	7	6	7
6	6	6	6	6	6	6	5	5	5	5	6	7	8	8	7	6	7	7	6	7	7	8	7	7	7	6	6	6	6	8	8	7	7	5	5
7	5	6	6	6	6	6	6	6	5	5	6	6	9	9	9	9	9	9	8	9	9	9	8	8	8	8	8	8	8	9	8	8	8	7	7
														9	8	8	9	8	9	8	8	8	8	8	7	7	7								

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: DECEMBER 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

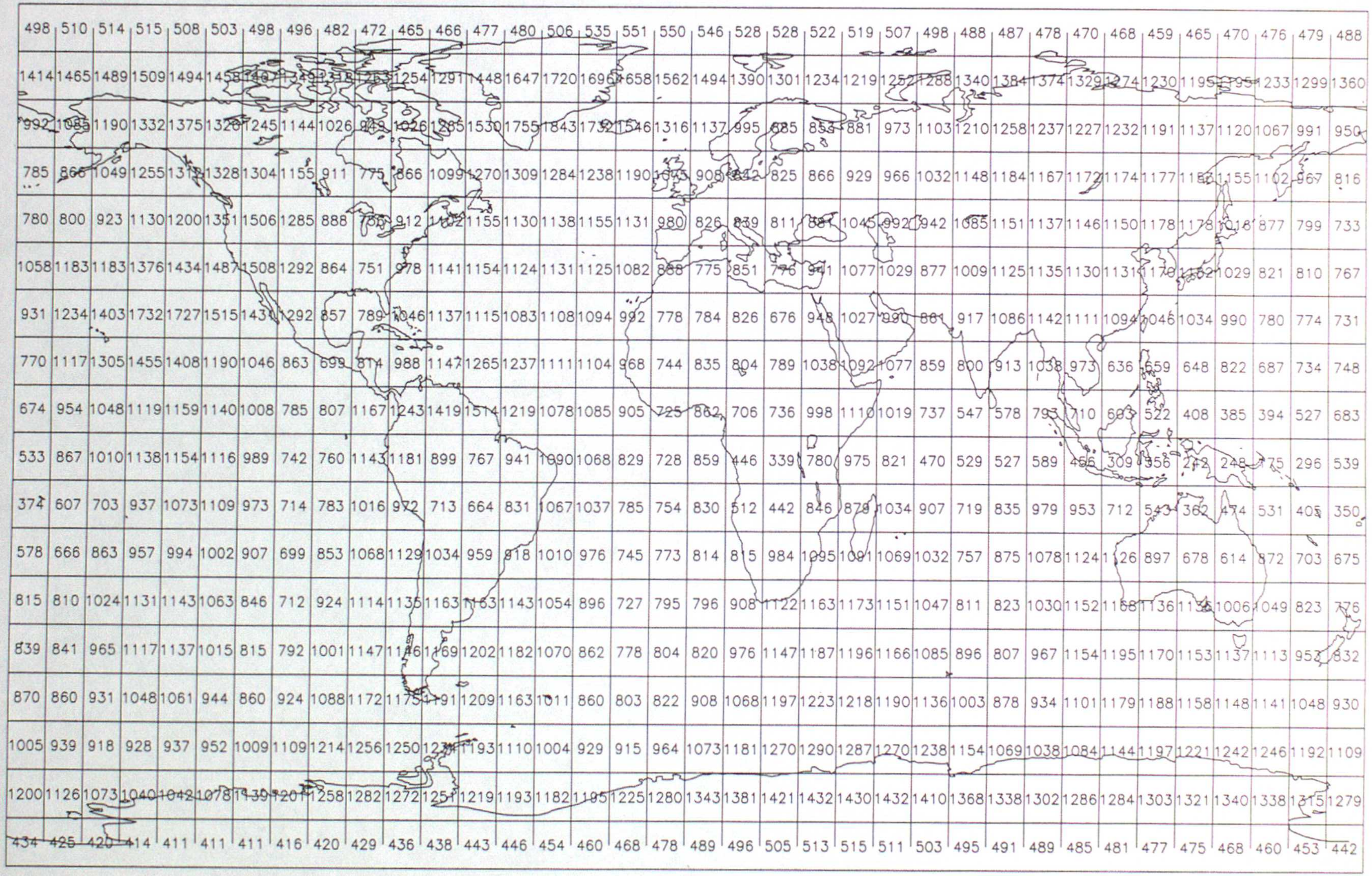
HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

ATOVS : MEAN DAILY NUMBER OF OBSERVATIONS

FIGURE 25

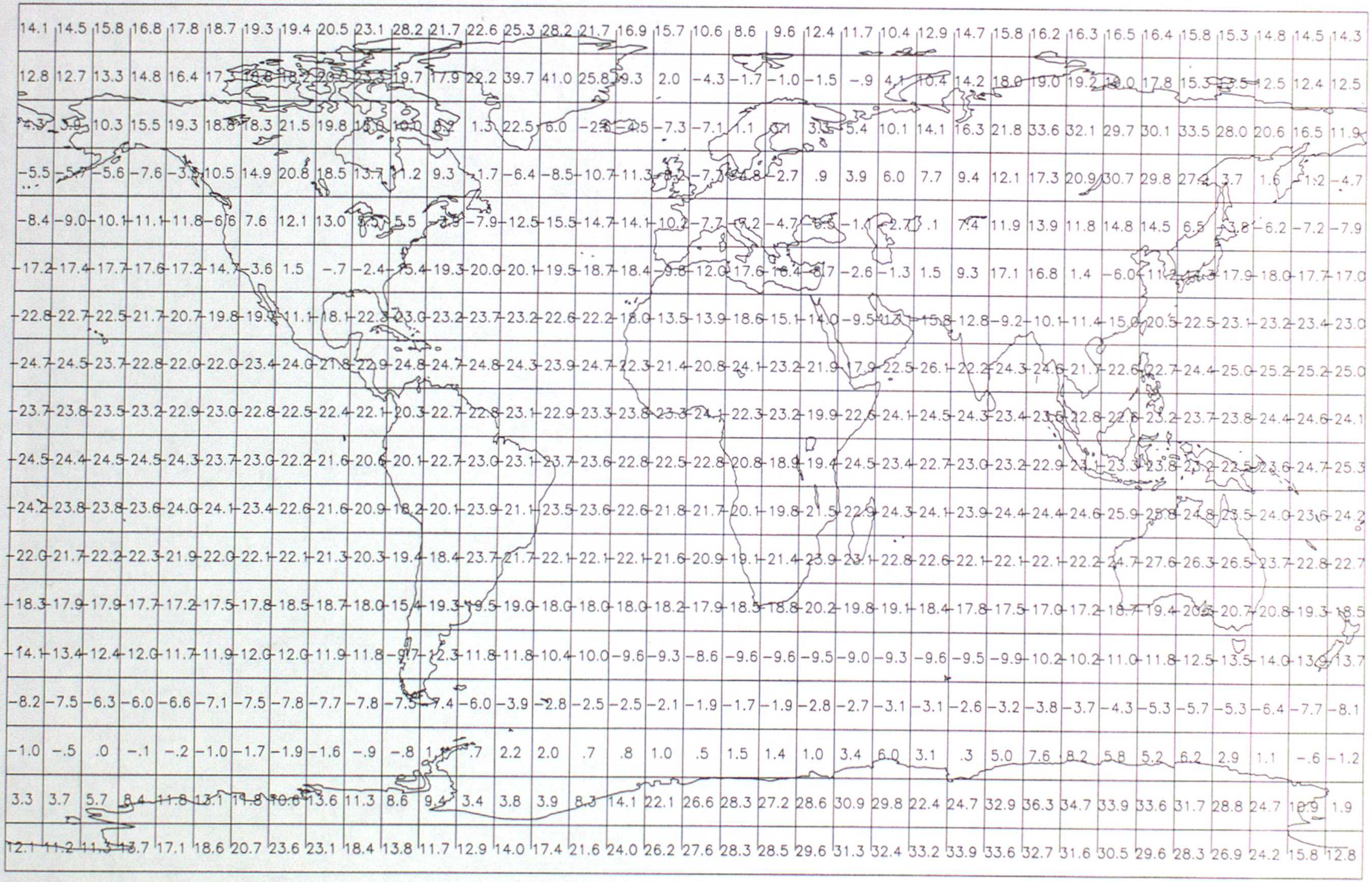
DECEMBER 2000
NOAA-15, USING ALL OBSERVATIONS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 627328



498	510	514	515	508	503	498	496	482	472	465	466	477	480	506	535	551	550	546	528	528	522	519	507	498	488	487	478	470	468	459	465	470	476	479	488
1414	1465	1489	1509	1494	1458	1407	1349	1318	1263	1254	1291	1448	1647	1720	1696	1658	1562	1494	1390	1301	1234	1219	1252	1288	1340	1384	1374	1329	1274	1230	1195	1195	1233	1299	1360
992	1085	1190	1332	1375	1326	1245	1144	1026	949	1026	1285	1530	1755	1843	1732	1546	1316	1137	995	685	853	881	973	1103	1210	1258	1237	1227	1232	1191	1137	1120	1067	991	950
785	866	1049	1255	1312	1328	1304	1155	911	775	866	1099	1270	1309	1284	1238	1190	1045	908	842	825	866	929	966	1032	1148	1184	1167	1172	1174	1177	1188	1155	1102	967	816
780	800	923	1130	1200	1351	1506	1285	888	755	912	1102	1155	1130	1138	1155	1131	980	826	839	811	881	1045	992	942	1085	1151	1137	1146	1150	1178	1178	1018	877	799	733
1058	1183	1183	1376	1434	1487	1508	1292	864	751	978	1141	1154	1124	1131	1125	1082	888	775	851	776	941	1077	1029	877	1009	1125	1135	1130	1131	1170	1152	1029	821	810	767
931	1234	1403	1732	1727	1515	1430	1292	857	789	1046	1137	1115	1083	1108	1094	992	778	784	826	676	948	1027	990	881	917	1086	1142	1111	1094	1046	1034	990	780	774	731
770	1117	1305	1455	1408	1190	1046	863	699	814	988	1147	1265	1237	1111	1104	968	744	835	804	789	1038	1092	1077	859	800	913	1038	973	636	659	648	822	687	734	748
674	954	1048	1119	1159	1140	1008	785	807	1167	1243	1419	1514	1219	1078	1085	905	725	862	706	736	998	1110	1019	737	547	578	793	710	603	522	408	385	394	527	683
533	867	1010	1138	1154	1116	989	742	760	1143	1181	899	767	941	1090	1068	829	728	859	446	339	780	975	821	470	529	527	589	456	309	356	272	248	175	296	539
374	607	703	937	1073	1109	973	714	783	1016	972	713	664	831	1067	1037	785	754	830	512	442	846	878	1034	907	719	835	979	953	712	543	362	474	531	405	350
578	666	863	957	994	1002	907	699	853	1068	1129	1034	959	918	1010	976	745	773	814	815	984	1095	1091	1069	1032	757	875	1078	1124	1126	897	678	614	872	703	675
815	810	1024	1131	1143	1063	846	712	924	1114	1135	1163	1163	1143	1054	896	727	795	796	908	1122	1163	1173	1151	1047	811	823	1030	1152	1168	1136	1136	1006	1049	823	776
839	841	965	1117	1137	1015	815	792	1001	1147	1146	1169	1202	1182	1070	862	778	804	820	976	1147	1187	1196	1166	1085	896	807	967	1154	1195	1170	1153	1137	1113	953	832
870	860	931	1048	1061	944	860	924	1088	1172	1175	1191	1209	1163	1011	860	803	822	908	1068	1197	1223	1218	1190	1136	1003	878	934	1101	1179	1188	1158	1148	1141	1048	930
1005	939	918	928	937	952	1009	1109	1214	1256	1250	1234	1193	1110	1004	929	915	964	1073	1181	1270	1290	1287	1270	1238	1154	1069	1038	1084	1144	1197	1221	1242	1246	1192	1109
1200	1126	1073	1040	1042	1078	1139	1201	1258	1282	1272	1251	1219	1193	1182	1195	1225	1280	1343	1381	1421	1432	1430	1432	1410	1368	1338	1302	1286	1284	1303	1321	1340	1338	1315	1279
434	425	420	414	411	411	411	416	420	429	436	438	443	446	454	460	468	478	489	496	505	513	515	511	503	495	491	489	485	481	477	475	468	460	453	442

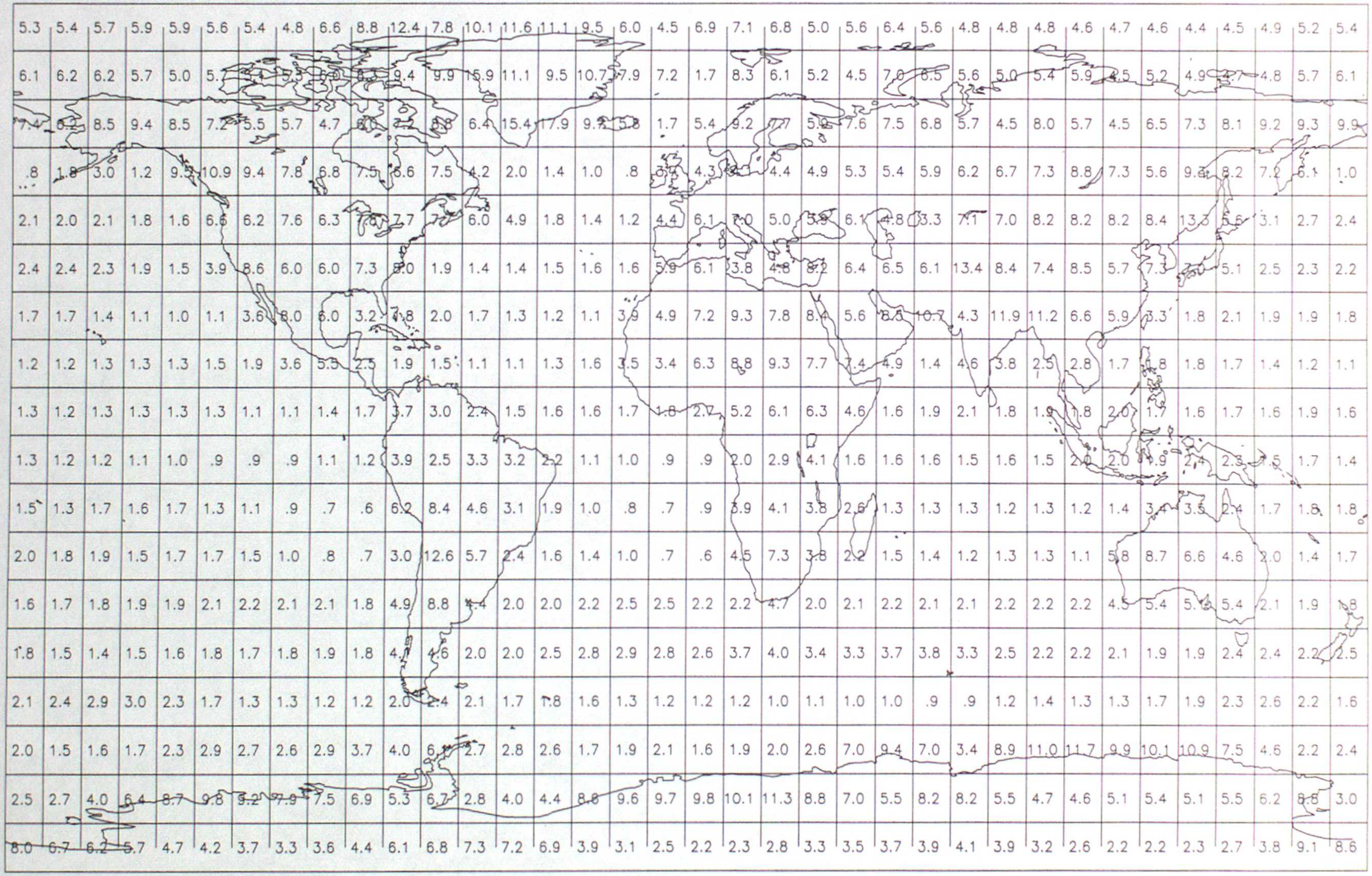
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
DECEMBER 2000 : HIRS8 channel (Surface)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 26


14.1 14.5 15.8 16.8 17.8 18.7 19.3 19.4 20.5 23.1 28.2 21.7 22.6 25.3 28.2 21.7 16.9 15.7 10.6 8.6 9.6 12.4 11.7 10.4 12.9 14.7 15.8 16.2 16.3 16.5 16.4 15.8 15.3 14.8 14.5 14.3
12.8 12.7 13.3 14.8 16.4 17.3 18.6 18.2 20.6 23.5 19.7 17.9 22.2 39.7 41.0 25.8 9.3 2.0 −4.3 −1.7 −1.0 −1.5 −.9 4.1 10.4 14.2 18.0 19.0 19.2 19.0 17.8 15.3 13.5 12.5 12.4 12.5
4.3 3.9 10.3 15.5 19.3 18.8 18.3 21.5 19.8 15.0 10.0 8.2 1.3 22.5 6.0 −2.5 −4.5 −7.3 −7.1 1.1 .1 3.5 5.4 10.1 14.1 16.3 21.8 33.6 32.1 29.7 30.1 33.5 28.0 20.6 16.5 11.9
−5.5 −5.7 −5.6 −7.6 −3.5 10.5 14.9 20.8 18.5 13.7 11.2 9.3 −1.7 −6.4 −8.5 −10.7 −11.3 −8.2 −7.7 −4.8 −2.7 .9 3.9 6.0 7.7 9.4 12.1 17.3 20.9 30.7 29.8 27.4 3.7 1.6 −1.2 −4.7
−8.4 −9.0 −10.1 −11.1 −11.8 −6.6 7.6 12.1 13.0 3.5 5.5 −3.9 −7.9 −12.5 −15.5 −14.7 −14.1 −10.2 −7.7 −7.2 −4.7 −5.5 −1.1 −2.7 .1 7.4 11.9 13.9 11.8 14.8 14.5 6.5 −3.8 −6.2 −7.2 −7.9
−17.2 −17.4 −17.7 −17.6 −17.2 −14.7 −3.6 1.5 −.7 −2.4 −15.4 −19.3 −20.0 −20.1 −19.5 −18.7 −18.4 −9.8 −12.0 −17.6 −16.4 −8.7 −2.6 −1.3 1.5 9.3 17.1 16.8 1.4 −6.0 −11.2 −14.3 −17.9 −18.0 −17.7 −17.0
−22.8 −22.7 −22.5 −21.7 −20.7 −19.8 −19.9 −11.1 −18.1 −22.3 −23.0 −23.2 −23.7 −23.2 −22.6 −22.2 −18.0 −13.5 −13.9 −18.6 −15.1 −14.0 −9.5 −13.1 −15.8 −12.8 −9.2 −10.1 −11.4 −15.0 −20.5 −22.5 −23.1 −23.2 −23.4 −23.0
−24.7 −24.5 −23.7 −22.8 −22.0 −22.0 −23.4 −24.0 −21.8 −22.9 −24.8 −24.7 −24.8 −24.3 −23.9 −24.7 −22.3 −21.4 −20.8 −24.1 −23.2 −21.9 −17.9 −22.5 −26.1 −22.2 −24.3 −24.6 −21.7 −22.6 −22.7 −24.4 −25.0 −25.2 −25.2 −25.0
−23.7 −23.8 −23.5 −23.2 −22.9 −23.0 −22.8 −22.5 −22.4 −22.1 −20.3 −22.7 −22.8 −23.1 −22.9 −23.3 −23.8 −23.3 −24.1 −22.3 −23.2 −19.9 −22.6 −24.1 −24.5 −24.3 −23.4 −23.6 −22.8 −22.6 −23.2 −23.7 −23.8 −24.4 −24.6 −24.1
−24.5 −24.4 −24.5 −24.5 −24.3 −23.7 −23.0 −22.2 −21.6 −20.6 −20.1 −22.7 −23.0 −23.1 −23.7 −23.6 −22.8 −22.5 −22.8 −20.8 −18.9 −19.4 −24.5 −23.4 −22.7 −23.0 −23.2 −22.9 −23.1 −23.3 −23.8 −23.2 −22.5 −23.6 −24.7 −25.3
−24.2 −23.8 −23.8 −23.6 −24.0 −24.1 −23.4 −22.6 −21.6 −20.9 −18.2 −20.1 −23.9 −21.1 −23.5 −23.6 −22.6 −21.8 −21.7 −20.1 −19.8 −21.5 −22.9 −24.3 −24.1 −23.9 −24.4 −24.4 −24.6 −25.9 −25.8 −24.8 −23.5 −24.0 −23.6 −24.2
−22.0 −21.7 −22.2 −22.3 −21.9 −22.0 −22.1 −22.1 −21.3 −20.3 −19.4 −18.4 −23.7 −21.7 −22.1 −22.1 −22.1 −21.6 −20.9 −19.1 −21.4 −23.9 −23.1 −22.8 −22.6 −22.1 −22.1 −22.1 −22.2 −24.7 −27.6 −26.3 −26.5 −23.7 −22.8 −22.7
−18.3 −17.9 −17.9 −17.7 −17.2 −17.5 −17.8 −18.5 −18.7 −18.0 −15.4 −19.3 −19.5 −19.0 −18.0 −18.0 −18.0 −18.2 −17.9 −18.5 −18.8 −20.2 −19.8 −19.1 −18.4 −17.8 −17.5 −17.0 −17.2 −18.7 −19.4 −20.5 −20.7 −20.8 −19.3 −18.5
−14.1 −13.4 −12.4 −12.0 −11.7 −11.9 −12.0 −12.0 −11.9 −11.8 −9.7 −12.3 −11.8 −11.8 −10.4 −10.0 −9.6 −9.3 −8.6 −9.6 −9.6 −9.5 −9.0 −9.3 −9.6 −9.5 −9.9 −10.2 −10.2 −11.0 −11.8 −12.5 −13.5 −14.0 −13.9 −13.7
−8.2 −7.5 −6.3 −6.0 −6.6 −7.1 −7.5 −7.8 −7.7 −7.8 −7.5 −7.4 −6.0 −3.9 −2.8 −2.5 −2.5 −2.1 −1.9 −1.7 −1.9 −2.8 −2.7 −3.1 −3.1 −2.6 −3.2 −3.8 −3.7 −4.3 −5.3 −5.7 −5.3 −6.4 −7.7 −8.1
−1.0 −.5 .0 −.1 −.2 −1.0 −1.7 −1.9 −1.6 −.9 −.8 [illegible] .7 2.2 2.0 .7 .8 1.0 .5 1.5 1.4 1.0 3.4 6.0 3.1 .3 5.0 7.6 8.2 5.8 5.2 6.2 2.9 1.1 −.6 −1.2
3.3 3.7 5.7 8.4 11.8 13.1 11.8 10.6 13.6 11.3 8.6 9.4 3.4 3.8 3.9 8.3 14.1 22.1 26.6 28.3 27.2 28.6 30.9 29.8 22.4 24.7 32.9 36.3 34.7 33.9 33.6 31.7 28.8 24.7 10.9 1.9
12.1 11.2 11.3 13.7 17.1 18.6 20.7 23.6 23.1 18.4 13.8 11.7 12.9 14.0 17.4 21.6 24.0 26.2 27.6 28.3 28.5 29.6 31.3 32.4 33.2 33.9 33.6 32.7 31.6 30.5 29.6 28.3 26.9 24.2 15.8 12.8

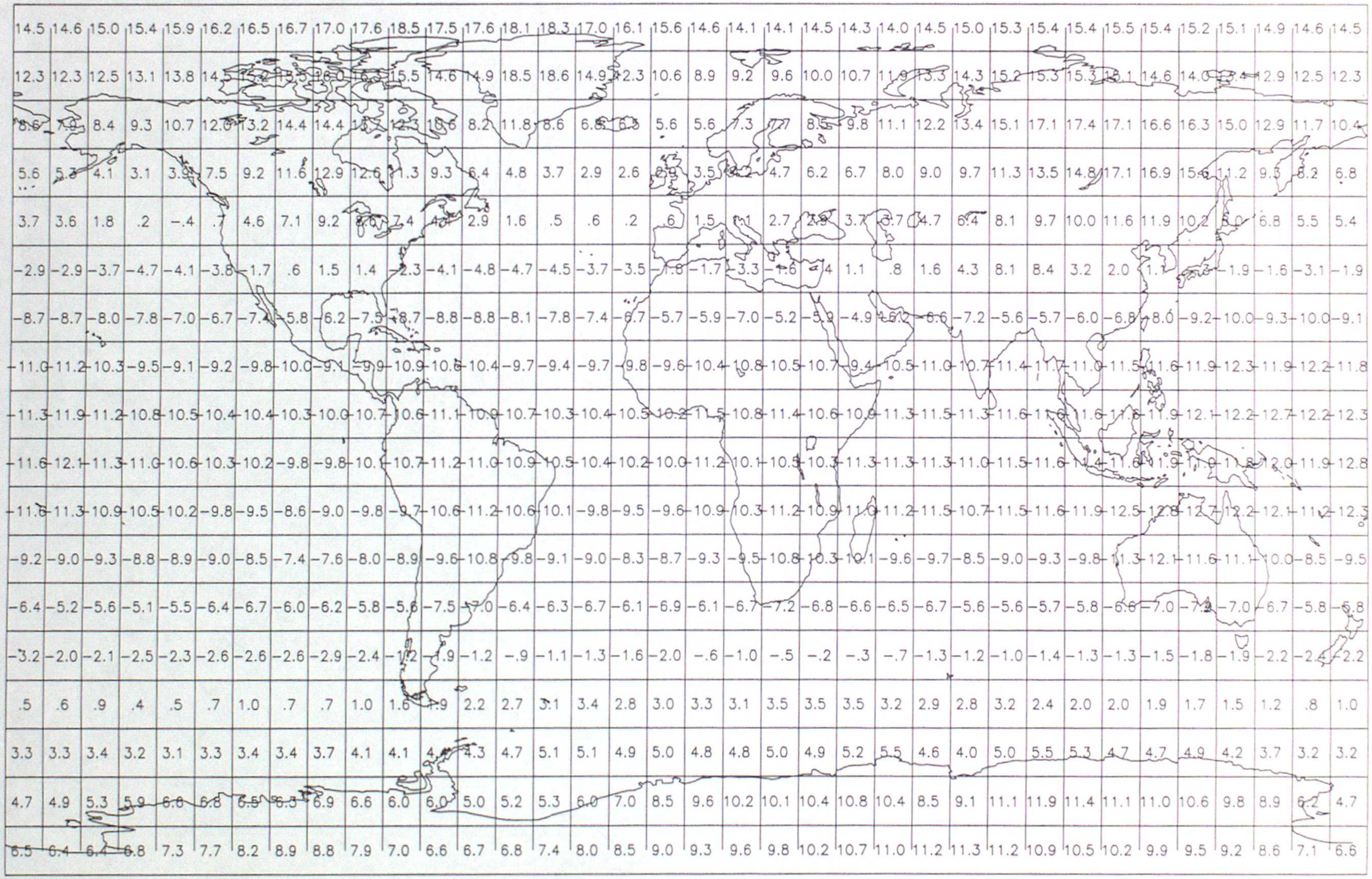
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
DECEMBER 2000 : HIRS8 channel (Surface)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 27



5.3	5.4	5.7	5.9	5.9	5.6	5.4	4.8	6.6	8.8	12.4	7.8	10.1	11.6	11.1	9.5	6.0	4.5	6.9	7.1	6.8	5.0	5.6	6.4	5.6	4.8	4.8	4.8	4.6	4.7	4.6	4.4	4.5	4.9	5.2	5.4
6.1	6.2	6.2	5.7	5.0	5.7	5.4	5.3	6.0	8.3	9.4	9.9	15.9	11.1	9.5	10.7	7.9	7.2	1.7	8.3	6.1	5.2	4.5	7.0	6.5	5.6	5.0	5.4	5.9	4.5	5.2	4.9	4.7	4.8	5.7	6.1
7.4	6.2	8.5	9.4	8.5	7.2	5.5	5.7	4.7	6.0	7.2	8.8	6.4	15.4	17.9	9.7	5.8	1.7	5.4	9.2	7.7	5.9	7.6	7.5	6.8	5.7	4.5	8.0	5.7	4.5	6.5	7.3	8.1	9.2	9.3	9.9
.8	1.8	3.0	1.2	9.5	10.9	9.4	7.8	6.8	7.5	6.6	7.5	4.2	2.0	1.4	1.0	.8	3.7	4.3	[illegible]	4.4	4.9	5.3	5.4	5.9	6.2	6.7	7.3	8.8	7.3	5.6	9.3	8.2	7.2	6.1	1.0
2.1	2.0	2.1	1.8	1.6	6.6	6.2	7.6	6.3	7.6	7.7	7.2	6.0	4.9	1.8	1.4	1.2	4.4	6.1	7.0	5.0	5.9	6.1	4.8	3.3	7.1	7.0	8.2	8.2	8.2	8.4	13.3	5.6	3.1	2.7	2.4
2.4	2.4	2.3	1.9	1.5	3.9	8.6	6.0	6.0	7.3	8.0	1.9	1.4	1.4	1.5	1.6	1.6	5.9	6.1	3.8	4.8	8.2	6.4	6.5	6.1	13.4	8.4	7.4	8.5	5.7	7.3	7.0	5.1	2.5	2.3	2.2
1.7	1.7	1.4	1.1	1.0	1.1	3.6	8.0	6.0	3.2	4.8	2.0	1.7	1.3	1.2	1.1	3.9	4.9	7.2	9.3	7.8	8.4	5.6	8.5	10.7	4.3	11.9	11.2	6.6	5.9	3.3	1.8	2.1	1.9	1.9	1.8
1.2	1.2	1.3	1.3	1.3	1.5	1.9	3.6	5.5	2.5	1.9	1.5	1.1	1.1	1.3	1.6	3.5	3.4	6.3	8.8	9.3	7.7	7.4	4.9	1.4	4.6	3.8	2.5	2.8	1.7	1.8	1.8	1.7	1.4	1.2	1.1
1.3	1.2	1.3	1.3	1.3	1.3	1.1	1.1	1.4	1.7	3.7	3.0	2.4	1.5	1.6	1.6	1.7	1.8	2.7	5.2	6.1	6.3	4.6	1.6	1.9	2.1	1.8	1.9	1.8	2.0	1.7	1.6	1.7	1.6	1.9	1.6
1.3	1.2	1.2	1.1	1.0	.9	.9	.9	1.1	1.2	3.9	2.5	3.3	3.2	2.2	1.1	1.0	.9	.9	2.0	2.9	4.1	1.6	1.6	1.6	1.5	1.6	1.5	2.0	2.0	1.9	2.4	2.3	1.5	1.7	1.4
1.5	1.3	1.7	1.6	1.7	1.3	1.1	.9	.7	.6	6.2	8.4	4.6	3.1	1.9	1.0	.8	.7	.9	3.9	4.1	3.8	2.6	1.3	1.3	1.3	1.2	1.3	1.2	1.4	3.4	3.5	2.4	1.7	1.8	1.8
2.0	1.8	1.9	1.5	1.7	1.7	1.5	1.0	.8	.7	3.0	12.6	5.7	2.4	1.6	1.4	1.0	.7	.6	4.5	7.3	3.8	2.2	1.5	1.4	1.2	1.3	1.3	1.1	5.8	8.7	6.6	4.6	2.0	1.4	1.7
1.6	1.7	1.8	1.9	1.9	2.1	2.2	2.1	2.1	1.8	4.9	8.8	4.4	2.0	2.0	2.2	2.5	2.5	2.2	2.2	4.7	2.0	2.1	2.2	2.1	2.1	2.2	2.2	2.2	4.5	5.4	5.1	5.4	2.1	1.9	1.8
1.8	1.5	1.4	1.5	1.6	1.8	1.7	1.8	1.9	1.8	4.1	4.6	2.0	2.0	2.5	2.8	2.9	2.8	2.6	3.7	4.0	3.4	3.3	3.7	3.8	3.3	2.5	2.2	2.2	2.1	1.9	1.9	2.4	2.4	2.2	2.5
2.1	2.4	2.9	3.0	2.3	1.7	1.3	1.3	1.2	1.2	2.0	2.4	2.1	1.7	1.8	1.6	1.3	1.2	1.2	1.2	1.0	1.1	1.0	1.0	.9	.9	1.2	1.4	1.3	1.3	1.7	1.9	2.3	2.6	2.2	1.6
2.0	1.5	1.6	1.7	2.3	2.9	2.7	2.6	2.9	3.7	4.0	[illegible]	2.7	2.8	2.6	1.7	1.9	2.1	1.6	1.9	2.0	2.6	7.0	9.4	7.0	3.4	8.9	11.0	11.7	9.9	10.1	10.9	7.5	4.6	2.2	2.4
2.5	2.7	4.0	6.4	8.7	9.8	9.2	7.9	7.5	6.9	5.3	6.7	2.8	4.0	4.4	8.8	9.6	9.7	9.8	10.1	11.3	8.8	7.0	5.5	8.2	8.2	5.5	4.7	4.6	5.1	5.4	5.1	5.5	6.2	8.8	3.0
8.0	6.7	6.2	5.7	4.7	4.2	3.7	3.3	3.6	4.4	6.1	6.8	7.3	7.2	6.9	3.9	3.1	2.5	2.2	2.3	2.8	3.3	3.5	3.7	3.9	4.1	3.9	3.2	2.6	2.2	2.2	2.3	2.7	3.8	9.1	8.6

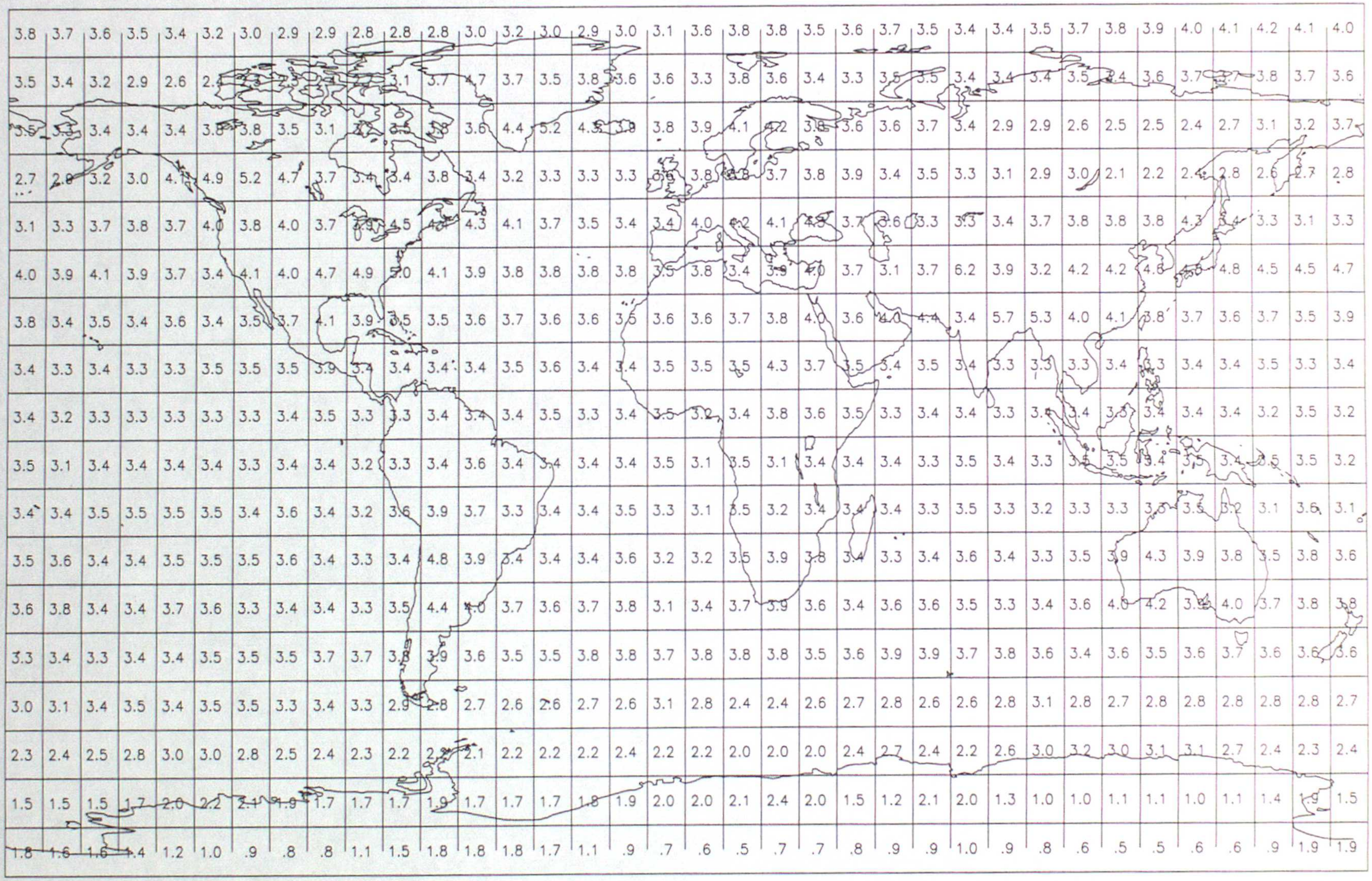
ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)　　　　FIGURE 28
DECEMBER 2000　: HIRS15 Channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS



14.5	14.6	15.0	15.4	15.9	16.2	16.5	16.7	17.0	17.6	18.5	17.5	17.6	18.1	18.3	17.0	16.1	15.6	14.6	14.1	14.1	14.5	14.3	14.0	14.5	15.0	15.3	15.4	15.4	15.5	15.4	15.2	15.1	14.9	14.6	14.5
12.3	12.3	12.5	13.1	13.8	14.5	15.2	15.5	16.0	16.3	15.5	14.6	14.9	18.5	18.6	14.9	12.3	10.6	8.9	9.2	9.6	10.0	10.7	11.9	13.3	14.3	15.2	15.3	15.3	15.1	14.6	14.0	13.4	12.9	12.5	12.3
8.6	7.9	8.4	9.3	10.7	12.0	13.2	14.4	14.4	13.7	12.3	10.6	8.2	11.8	8.6	6.8	6.5	5.6	5.6	7.3	7.7	8.5	9.8	11.1	12.2	13.4	15.1	17.1	17.4	17.1	16.6	16.3	15.0	12.9	11.7	10.4
5.6	5.3	4.1	3.1	3.9	7.5	9.2	11.6	12.9	12.6	11.3	9.3	6.4	4.8	3.7	2.9	2.6	2.9	3.5	3.2	4.7	6.2	6.7	8.0	9.0	9.7	11.3	13.5	14.8	17.1	16.9	15.6	11.2	9.3	8.2	6.8
3.7	3.6	1.8	.2	–.4	.7	4.6	7.1	9.2	8.0	7.4	4.1	2.9	1.6	.5	.6	.2	.6	1.5	1.1	2.7	2.9	3.7	3.7	4.7	6.4	8.1	9.7	10.0	11.6	11.9	10.2	8.0	6.8	5.5	5.4
–2.9	–2.9	–3.7	–4.7	–4.1	–3.8	–1.7	.6	1.5	1.4	–2.3	–4.1	–4.8	–4.7	–4.5	–3.7	–3.5	–1.8	–1.7	–3.3	–1.6	.4	1.1	.8	1.6	4.3	8.1	8.4	3.2	2.0	1.1	–.3	–1.9	–1.6	–3.1	–1.9
–8.7	–8.7	–8.0	–7.8	–7.0	–6.7	–7.4	–5.8	–6.2	–7.5	–8.7	–8.8	–8.8	–8.1	–7.8	–7.4	–6.7	–5.7	–5.9	–7.0	–5.2	–5.9	–4.9	–6.2	–6.6	–7.2	–5.6	–5.7	–6.0	–6.8	–8.0	–9.2	–10.0	–9.3	–10.0	–9.1
–11.0	–11.2	–10.3	–9.5	–9.1	–9.2	–9.8	–10.0	–9.1	–9.9	–10.9	–10.6	–10.4	–9.7	–9.4	–9.7	–9.8	–9.6	–10.4	–10.8	–10.5	–10.7	–9.4	–10.5	–11.0	–10.7	–11.4	–11.7	–11.0	–11.5	–11.6	–11.9	–12.3	–11.9	–12.2	–11.8
–11.3	–11.9	–11.2	–10.8	–10.5	–10.4	–10.4	–10.3	–10.0	–10.7	–10.6	–11.1	–10.9	–10.7	–10.3	–10.4	–10.5	–10.2	–11.5	–10.8	–11.4	–10.6	–10.9	–11.3	–11.5	–11.3	–11.6	–11.6	–11.6	–11.6	–11.9	–12.1	–12.2	–12.7	–12.2	–12.3
–11.6	–12.1	–11.3	–11.0	–10.6	–10.3	–10.2	–9.8	–9.8	–10.1	–10.7	–11.2	–11.0	–10.9	–10.5	–10.4	–10.2	–10.0	–11.2	–10.1	–10.5	–10.3	–11.3	–11.3	–11.3	–11.0	–11.5	–11.6	–11.4	–11.6	–11.9	–11.9	–11.8	–12.0	–11.9	–12.8
–11.6	–11.3	–10.9	–10.5	–10.2	–9.8	–9.5	–8.6	–9.0	–9.8	–9.7	–10.6	–11.2	–10.6	–10.1	–9.8	–9.5	–9.6	–10.9	–10.3	–11.2	–10.9	–11.0	–11.2	–11.5	–10.7	–11.5	–11.6	–11.9	–12.5	–12.8	–12.7	–12.2	–12.1	–11.2	–12.3
–9.2	–9.0	–9.3	–8.8	–8.9	–9.0	–8.5	–7.4	–7.6	–8.0	–8.9	–9.6	–10.8	–9.8	–9.1	–9.0	–8.3	–8.7	–9.3	–9.5	–10.8	–10.3	–10.1	–9.6	–9.7	–8.5	–9.0	–9.3	–9.8	–11.3	–12.1	–11.6	–11.1	–10.0	–8.5	–9.5
–6.4	–5.2	–5.6	–5.1	–5.5	–6.4	–6.7	–6.0	–6.2	–5.8	–5.6	–7.5	–7.0	–6.4	–6.3	–6.7	–6.1	–6.9	–6.1	–6.7	–7.2	–6.8	–6.6	–6.5	–6.7	–5.6	–5.6	–5.7	–5.8	–6.6	–7.0	–7.2	–7.0	–6.7	–5.8	–5.8
–3.2	–2.0	–2.1	–2.5	–2.3	–2.6	–2.6	–2.6	–2.9	–2.4	–1.2	–1.9	–1.2	–.9	–1.1	–1.3	–1.6	–2.0	–.6	–1.0	–.5	–.2	–.3	–.7	–1.3	–1.2	–1.0	–1.4	–1.3	–1.3	–1.5	–1.8	–1.9	–2.2	–2.4	–2.2
.5	.6	.9	.4	.5	.7	1.0	.7	.7	1.0	1.6	1.9	2.2	2.7	3.1	3.4	2.8	3.0	3.3	3.1	3.5	3.5	3.5	3.2	2.9	2.8	3.2	2.4	2.0	2.0	1.9	1.7	1.5	1.2	.8	1.0
3.3	3.3	3.4	3.2	3.1	3.3	3.4	3.4	3.7	4.1	4.1	4.4	4.3	4.7	5.1	5.1	4.9	5.0	4.8	4.8	5.0	4.9	5.2	5.5	4.6	4.0	5.0	5.5	5.3	4.7	4.7	4.9	4.2	3.7	3.2	3.2
4.7	4.9	5.3	5.9	6.6	6.8	6.5	6.3	6.9	6.6	6.0	6.0	5.0	5.2	5.3	6.0	7.0	8.5	9.6	10.2	10.1	10.4	10.8	10.4	8.5	9.1	11.1	11.9	11.4	11.1	11.0	10.6	9.8	8.9	6.2	4.7
6.5	6.4	6.4	6.8	7.3	7.7	8.2	8.9	8.8	7.9	7.0	6.6	6.7	6.8	7.4	8.0	8.5	9.0	9.3	9.6	9.8	10.2	10.7	11.0	11.2	11.3	11.2	10.9	10.5	10.2	9.9	9.5	9.2	8.6	7.1	6.6

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
DECEMBER 2000 : HIRS15 channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

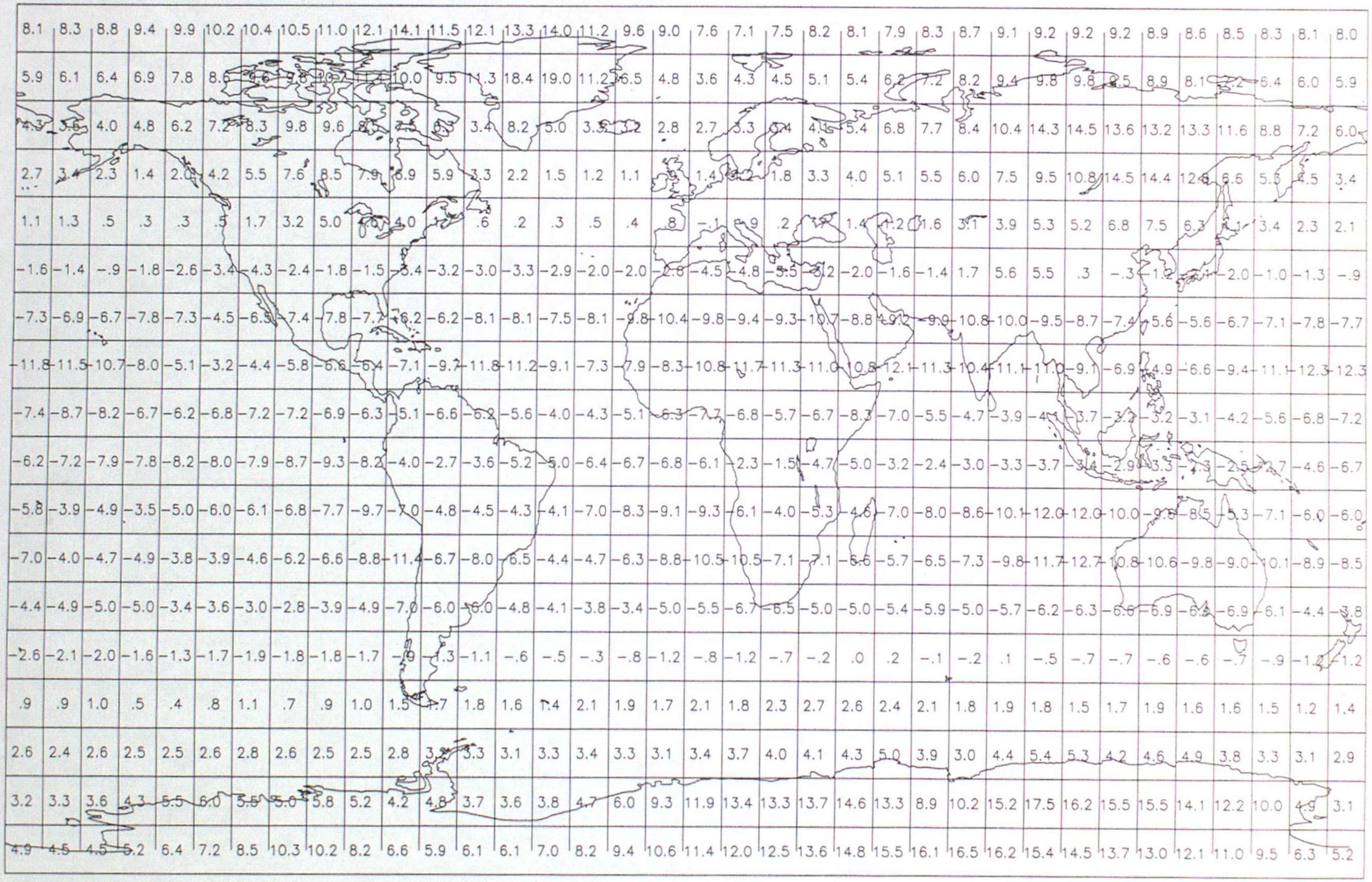
FIGURE 29



3.8	3.7	3.6	3.5	3.4	3.2	3.0	2.9	2.9	2.8	2.8	2.8	3.0	3.2	3.0	2.9	3.0	3.1	3.6	3.8	3.8	3.5	3.6	3.7	3.5	3.4	3.4	3.5	3.7	3.8	3.9	4.0	4.1	4.2	4.1	4.0
3.5	3.4	3.2	2.9	2.6	2.4	2.3	2.3	[illegible]	[illegible]	3.1	3.7	4.7	3.7	3.5	3.8	3.6	3.6	3.3	3.8	3.6	3.4	3.3	3.5	3.5	3.4	3.4	3.4	3.5	3.4	3.6	3.7	3.7	3.8	3.7	3.6
3.5	3.3	3.4	3.4	3.4	3.8	3.8	3.5	3.1	3.7	3.5	3.8	3.6	4.4	5.2	4.3	3.8	3.8	3.9	4.1	4.2	3.8	3.6	3.6	3.7	3.4	2.9	2.9	2.6	2.5	2.5	2.4	2.7	3.1	3.2	3.7
2.7	2.8	3.2	3.0	4.1	4.9	5.2	4.7	3.7	3.4	3.4	3.8	3.4	3.2	3.3	3.3	3.3	3.6	3.8	3.8	3.7	3.8	3.9	3.4	3.5	3.3	3.1	2.9	3.0	2.1	2.2	2.4	2.8	2.6	2.7	2.8
3.1	3.3	3.7	3.8	3.7	4.0	3.8	4.0	3.7	3.9	4.5	4.4	4.3	4.1	3.7	3.5	3.4	3.4	4.0	4.2	4.1	4.5	3.7	3.6	3.3	3.3	3.4	3.7	3.8	3.8	3.8	4.3	3.4	3.3	3.1	3.3
4.0	3.9	4.1	3.9	3.7	3.4	4.1	4.0	4.7	4.9	5.0	4.1	3.9	3.8	3.8	3.8	3.8	3.5	3.8	3.4	3.9	4.0	3.7	3.1	3.7	6.2	3.9	3.2	4.2	4.2	4.6	4.5	4.8	4.5	4.5	4.7
3.8	3.4	3.5	3.4	3.6	3.4	3.5	3.7	4.1	3.9	3.5	3.5	3.6	3.7	3.6	3.6	3.5	3.6	3.6	3.7	3.8	4.0	3.6	4.0	4.4	3.4	5.7	5.3	4.0	4.1	3.8	3.7	3.6	3.7	3.5	3.9
3.4	3.3	3.4	3.3	3.3	3.5	3.5	3.5	3.9	3.4	3.4	3.4	3.4	3.5	3.6	3.4	3.4	3.5	3.5	3.5	4.3	3.7	3.5	3.4	3.5	3.4	3.3	3.3	3.3	3.4	3.3	3.4	3.4	3.5	3.3	3.4
3.4	3.2	3.3	3.3	3.3	3.3	3.3	3.4	3.5	3.3	3.3	3.4	3.4	3.4	3.5	3.3	3.4	3.5	3.2	3.4	3.8	3.6	3.5	3.3	3.4	3.4	3.3	3.4	3.4	3.3	3.4	3.4	3.4	3.2	3.5	3.2
3.5	3.1	3.4	3.4	3.4	3.4	3.3	3.4	3.4	3.2	3.3	3.4	3.6	3.4	3.4	3.4	3.4	3.5	3.1	3.5	3.1	3.4	3.4	3.4	3.3	3.5	3.4	3.3	3.5	3.5	3.4	3.5	3.4	3.5	3.5	3.2
3.4	3.4	3.5	3.5	3.5	3.5	3.4	3.6	3.4	3.2	3.6	3.9	3.7	3.3	3.4	3.4	3.5	3.3	3.1	3.5	3.2	3.4	3.4	3.4	3.3	3.5	3.3	3.2	3.3	3.3	3.3	3.5	3.2	3.1	3.6	3.1
3.5	3.6	3.4	3.4	3.5	3.5	3.5	3.6	3.4	3.3	3.4	4.8	3.9	3.4	3.4	3.4	3.6	3.2	3.2	3.5	3.9	3.8	3.4	3.3	3.4	3.6	3.4	3.3	3.5	3.9	4.3	3.9	3.8	3.5	3.8	3.6
3.6	3.8	3.4	3.4	3.7	3.6	3.3	3.4	3.4	3.3	3.5	4.4	4.0	3.7	3.6	3.7	3.8	3.1	3.4	3.7	3.9	3.6	3.4	3.6	3.6	3.5	3.3	3.4	3.6	4.0	4.2	3.9	4.0	3.7	3.8	3.8
3.3	3.4	3.3	3.4	3.4	3.5	3.5	3.5	3.7	3.7	3.8	3.9	3.6	3.5	3.5	3.8	3.8	3.7	3.8	3.8	3.8	3.5	3.6	3.9	3.9	3.7	3.8	3.6	3.4	3.6	3.5	3.6	3.7	3.6	3.6	3.6
3.0	3.1	3.4	3.5	3.4	3.5	3.5	3.3	3.4	3.3	2.9	2.8	2.7	2.6	2.6	2.7	2.6	3.1	2.8	2.4	2.4	2.6	2.7	2.8	2.6	2.6	2.8	3.1	2.8	2.7	2.8	2.8	2.8	2.8	2.8	2.7
2.3	2.4	2.5	2.8	3.0	3.0	2.8	2.5	2.4	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.4	2.2	2.2	2.0	2.0	2.0	2.4	2.7	2.4	2.2	2.6	3.0	3.2	3.0	3.1	3.1	2.7	2.4	2.3	2.4
1.5	1.5	1.5	1.7	2.0	2.2	2.1	1.9	1.7	1.7	1.7	1.9	1.7	1.7	1.7	1.8	1.9	2.0	2.0	2.1	2.4	2.0	1.5	1.2	2.1	2.0	1.3	1.0	1.0	1.1	1.1	1.0	1.1	1.4	1.9	1.5
1.8	1.6	1.6	1.4	1.2	1.0	.9	.8	.8	1.1	1.5	1.8	1.8	1.8	1.7	1.1	.9	.7	.6	.5	.7	.7	.8	.9	.9	1.0	.9	.8	.6	.5	.5	.6	.6	.9	1.9	1.9

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
DECEMBER 2000 : HIRS11 Channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 30



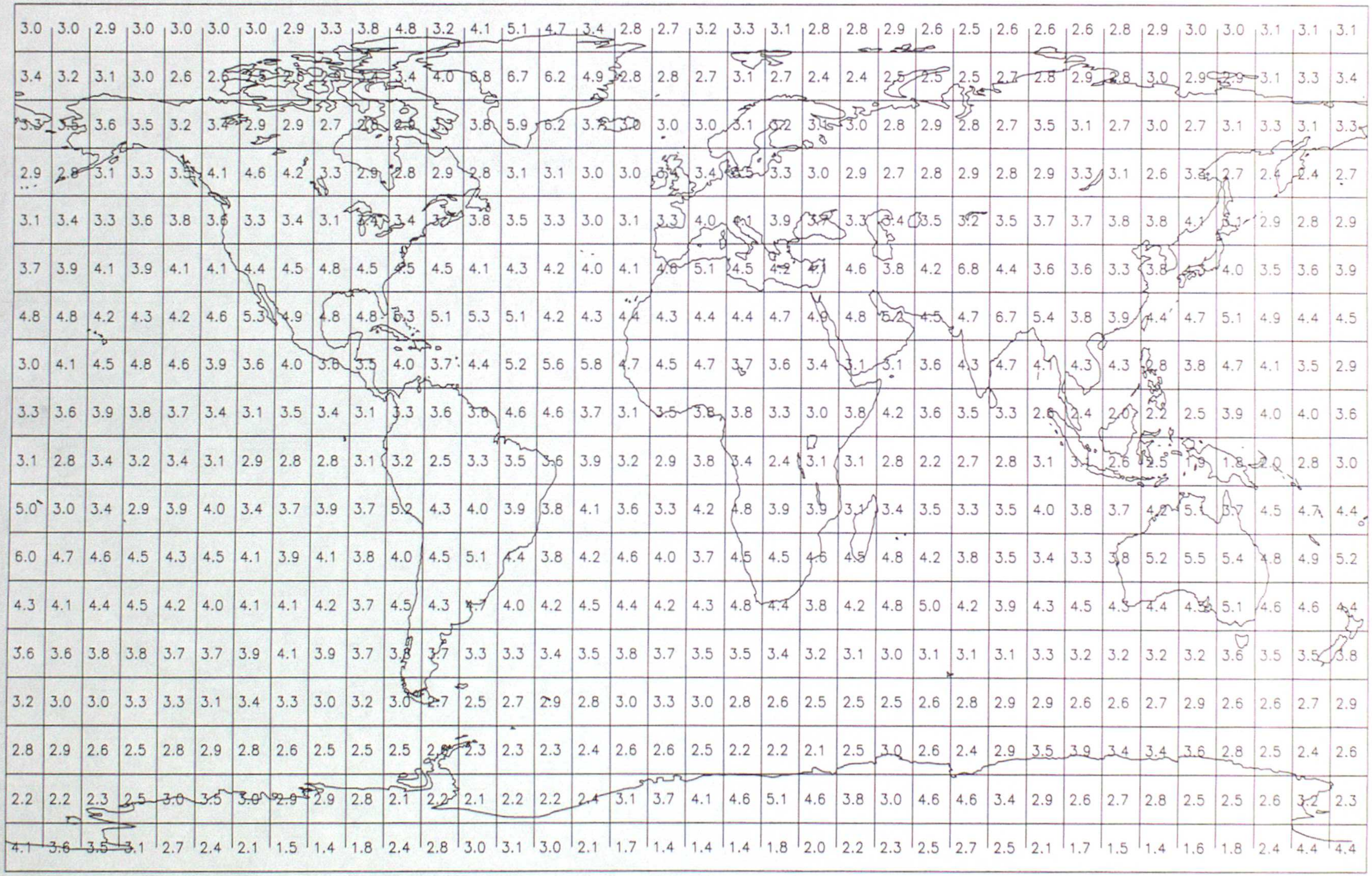
8.1	8.3	8.8	9.4	9.9	10.2	10.4	10.5	11.0	12.1	14.1	11.5	12.1	13.3	14.0	11.2	9.6	9.0	7.6	7.1	7.5	8.2	8.1	7.9	8.3	8.7	9.1	9.2	9.2	9.2	8.9	8.6	8.5	8.3	8.1	8.0
5.9	6.1	6.4	6.9	7.8	8.6	9.6	9.8	10.7	11.2	10.0	9.5	11.3	18.4	19.0	11.2	6.5	4.8	3.6	4.3	4.5	5.1	5.4	6.2	7.2	8.2	9.4	9.8	9.8	9.5	8.9	8.1	7.2	6.4	6.0	5.9
4.3	3.6	4.0	4.8	6.2	7.2	8.3	9.8	9.6	8.5	7.5	6.3	3.4	8.2	5.0	3.5	3.2	2.8	2.7	3.3	3.4	4.1	5.4	6.8	7.7	8.4	10.4	14.3	14.5	13.6	13.2	13.3	11.6	8.8	7.2	6.0
2.7	3.4	2.3	1.4	2.0	4.2	5.5	7.6	8.5	7.9	6.9	5.9	3.3	2.2	1.5	1.2	1.1	.9	1.4	3.2	1.8	3.3	4.0	5.1	5.5	6.0	7.5	9.5	10.8	14.5	14.4	12.6	6.6	5.3	4.5	3.4
1.1	1.3	.5	.3	.3	.5	1.7	3.2	5.0	4.6	4.0	[illegible]	.6	.2	.3	.5	.4	.8	−.1	.9	.2	[illegible]	1.4	1.2	1.6	3.1	3.9	5.3	5.2	6.8	7.5	6.3	1.1	3.4	2.3	2.1
−1.6	−1.4	−.9	−1.8	−2.6	−3.4	−4.3	−2.4	−1.8	−1.5	−3.4	−3.2	−3.0	−3.3	−2.9	−2.0	−2.0	−2.8	−4.5	−4.8	−5.5	−3.2	−2.0	−1.6	−1.4	1.7	5.6	5.5	.3	−.3	−1.2	[illegible]	−2.0	−1.0	−1.3	−.9
−7.3	−6.9	−6.7	−7.8	−7.3	−4.5	−6.5	−7.4	−7.8	−7.7	−6.2	−6.2	−8.1	−8.1	−7.5	−8.1	−9.8	−10.4	−9.8	−9.4	−9.3	−10.7	−8.8	−9.2	−9.9	−10.8	−10.0	−9.5	−8.7	−7.4	−5.6	−5.6	−6.7	−7.1	−7.8	−7.7
−11.8	−11.5	−10.7	−8.0	−5.1	−3.2	−4.4	−5.8	−6.6	−6.4	−7.1	−9.7	−11.8	−11.2	−9.1	−7.3	−7.9	−8.3	−10.8	−11.7	−11.3	−11.0	−10.8	−12.1	−11.3	−10.4	−11.1	−11.0	−9.1	−6.9	−4.9	−6.6	−9.4	−11.1	−12.3	−12.3
−7.4	−8.7	−8.2	−6.7	−6.2	−6.8	−7.2	−7.2	−6.9	−6.3	−5.1	−6.6	−6.2	−5.6	−4.0	−4.3	−5.1	−6.3	−7.7	−6.8	−5.7	−6.7	−8.3	−7.0	−5.5	−4.7	−3.9	−4.1	−3.7	−3.2	−3.2	−3.1	−4.2	−5.6	−6.8	−7.2
−6.2	−7.2	−7.9	−7.8	−8.2	−8.0	−7.9	−8.7	−9.3	−8.2	−4.0	−2.7	−3.6	−5.2	−5.0	−6.4	−6.7	−6.8	−6.1	−2.3	−1.5	−4.7	−5.0	−3.2	−2.4	−3.0	−3.3	−3.7	−3.4	−2.9	−3.3	−4.3	−2.5	−2.7	−4.6	−6.7
−5.8	−3.9	−4.9	−3.5	−5.0	−6.0	−6.1	−6.8	−7.7	−9.7	−7.0	−4.8	−4.5	−4.3	−4.1	−7.0	−8.3	−9.1	−9.3	−6.1	−4.0	−5.3	−4.6	−7.0	−8.0	−8.6	−10.1	−12.0	−12.0	−10.0	−9.6	−8.5	−5.3	−7.1	−6.0	−6.0
−7.0	−4.0	−4.7	−4.9	−3.8	−3.9	−4.6	−6.2	−6.6	−8.8	−11.4	−6.7	−8.0	−6.5	−4.4	−4.7	−6.3	−8.8	−10.5	−10.5	−7.1	−7.1	−6.6	−5.7	−6.5	−7.3	−9.8	−11.7	−12.7	−10.8	−10.6	−9.8	−9.0	−10.1	−8.9	−8.5
−4.4	−4.9	−5.0	−5.0	−3.4	−3.6	−3.0	−2.8	−3.9	−4.9	−7.0	−6.0	−6.0	−4.8	−4.1	−3.8	−3.4	−5.0	−5.5	−6.7	−6.5	−5.0	−5.0	−5.4	−5.9	−5.0	−5.7	−6.2	−6.3	−6.6	−6.9	−6.5	−6.9	−6.1	−4.4	−3.8
−2.6	−2.1	−2.0	−1.6	−1.3	−1.7	−1.9	−1.8	−1.8	−1.7	−.9	−1.3	−1.1	−.6	−.5	−.3	−.8	−1.2	−.8	−1.2	−.7	−.2	.0	.2	−.1	−.2	.1	−.5	−.7	−.7	−.6	−.6	−.7	−.9	−1.2	−1.2
.9	.9	1.0	.5	.4	.8	1.1	.7	.9	1.0	1.5	1.7	1.8	1.6	1.4	2.1	1.9	1.7	2.1	1.8	2.3	2.7	2.6	2.4	2.1	1.8	1.9	1.8	1.5	1.7	1.9	1.6	1.6	1.5	1.2	1.4
2.6	2.4	2.6	2.5	2.5	2.6	2.8	2.6	2.5	2.5	2.8	3.2	3.3	3.1	3.3	3.4	3.3	3.1	3.4	3.7	4.0	4.1	4.3	5.0	3.9	3.0	4.4	5.4	5.3	4.2	4.6	4.9	3.8	3.3	3.1	2.9
3.2	3.3	3.6	4.3	5.5	6.0	5.5	5.0	5.8	5.2	4.2	4.8	3.7	3.6	3.8	4.7	6.0	9.3	11.9	13.4	13.3	13.7	14.6	13.3	8.9	10.2	15.2	17.5	16.2	15.5	15.5	14.1	12.2	10.0	4.9	3.1
4.9	4.5	4.5	5.2	6.4	7.2	8.5	10.3	10.2	8.2	6.6	5.9	6.1	6.1	7.0	8.2	9.4	10.6	11.4	12.0	12.5	13.6	14.8	15.5	16.1	16.5	16.2	15.4	14.5	13.7	13.0	12.1	11.0	9.5	6.3	5.2

ATOVS : SD O−B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)

DECEMBER 2000 : HIRS11 channel (500−700 hPa)

NOAA−15, USING ALL OBSERVATIONS

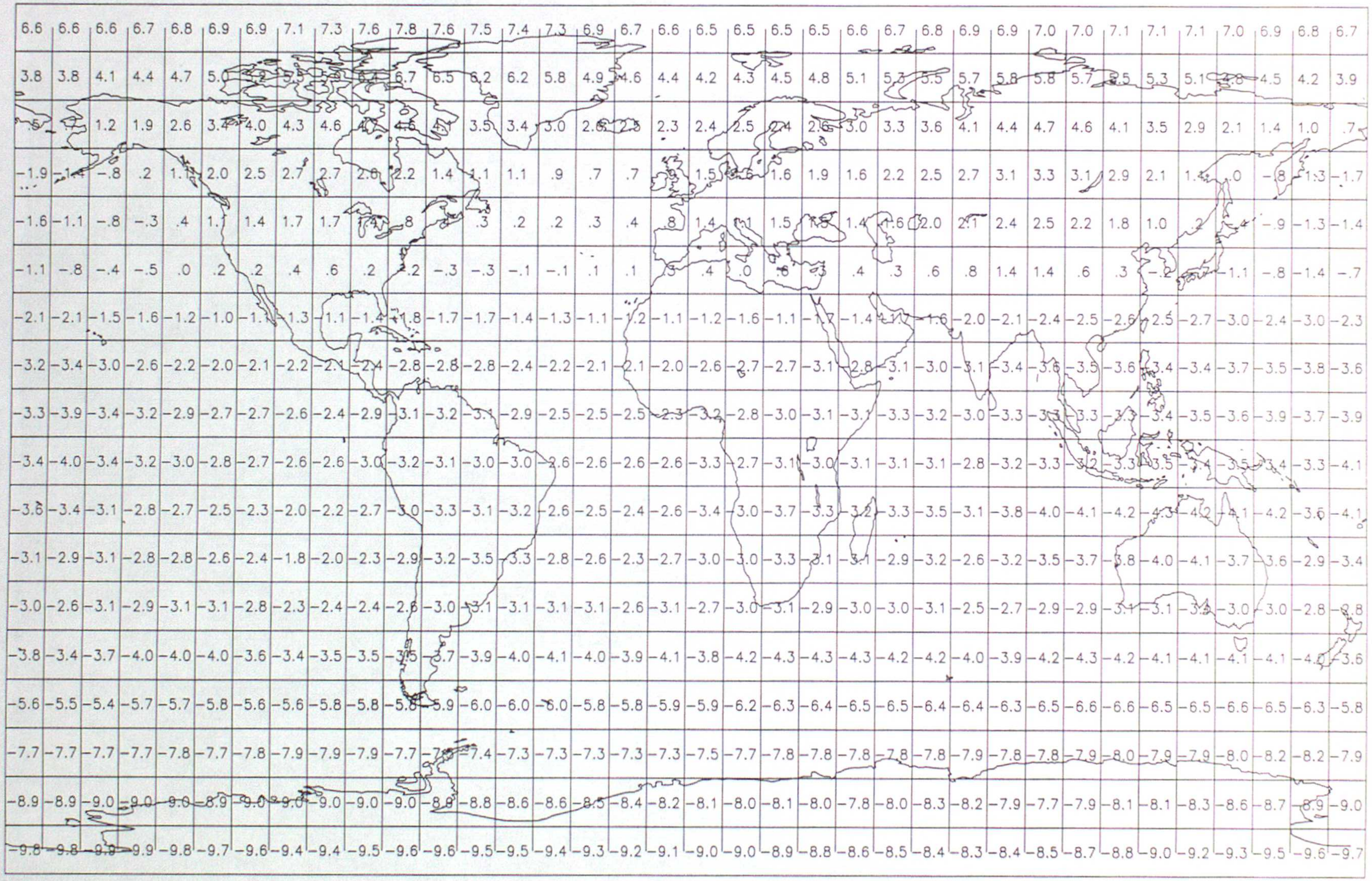
FIGURE 31



3.0	3.0	2.9	3.0	3.0	3.0	3.0	2.9	3.3	3.8	4.8	3.2	4.1	5.1	4.7	3.4	2.8	2.7	3.2	3.3	3.1	2.8	2.8	2.9	2.6	2.5	2.6	2.6	2.6	2.8	2.9	3.0	3.0	3.1	3.1	3.1
3.4	3.2	3.1	3.0	2.6	2.6	2.5	2.6	2.9	3.4	3.4	4.0	6.8	6.7	6.2	4.9	2.8	2.8	2.7	3.1	2.7	2.4	2.4	2.5	2.5	2.5	2.7	2.8	2.9	2.8	3.0	2.9	2.9	3.1	3.3	3.4
3.3	3.5	3.6	3.5	3.2	3.4	2.9	2.9	2.7	2.8	2.9	3.3	3.8	5.9	6.2	3.7	3.0	3.0	3.0	3.1	3.2	3.1	3.0	2.8	2.9	2.8	2.7	3.5	3.1	2.7	3.0	2.7	3.1	3.3	3.1	3.3
2.9	2.8	3.1	3.3	3.5	4.1	4.6	4.2	3.3	2.9	2.8	2.9	2.8	3.1	3.1	3.0	3.0	3.4	3.4	3.5	3.3	3.0	2.9	2.7	2.8	2.9	2.8	2.9	3.3	3.1	2.6	3.3	2.7	2.4	2.4	2.7
3.1	3.4	3.3	3.6	3.8	3.6	3.3	3.4	3.1	3.4	3.4	3.7	3.8	3.5	3.3	3.0	3.1	3.3	4.0	4.1	3.9	3.7	3.3	3.4	3.5	3.2	3.5	3.7	3.7	3.8	3.8	4.1	3.1	2.9	2.8	2.9
3.7	3.9	4.1	3.9	4.1	4.1	4.4	4.5	4.8	4.5	4.5	4.5	4.1	4.3	4.2	4.0	4.1	4.8	5.1	4.5	4.2	4.1	4.6	3.8	4.2	6.8	4.4	3.6	3.6	3.3	3.8	4.5	4.0	3.5	3.6	3.9
4.8	4.8	4.2	4.3	4.2	4.6	5.3	4.9	4.8	4.8	6.3	5.1	5.3	5.1	4.2	4.3	4.4	4.3	4.4	4.4	4.7	4.9	4.8	5.2	4.5	4.7	6.7	5.4	3.8	3.9	4.4	4.7	5.1	4.9	4.4	4.5
3.0	4.1	4.5	4.8	4.6	3.9	3.6	4.0	3.6	3.5	4.0	3.7	4.4	5.2	5.6	5.8	4.7	4.5	4.7	3.7	3.6	3.4	3.1	3.1	3.6	4.3	4.7	4.1	4.3	4.3	2.8	3.8	4.7	4.1	3.5	2.9
3.3	3.6	3.9	3.8	3.7	3.4	3.1	3.5	3.4	3.1	3.3	3.6	3.6	4.6	4.6	3.7	3.1	3.5	3.8	3.8	3.3	3.0	3.8	4.2	3.6	3.5	3.3	2.6	2.4	2.0	2.2	2.5	3.9	4.0	4.0	3.6
3.1	2.8	3.4	3.2	3.4	3.1	2.9	2.8	2.8	3.1	3.2	2.5	3.3	3.5	3.6	3.9	3.2	2.9	3.8	3.4	2.4	3.1	3.1	2.8	2.2	2.7	2.8	3.1	3.1	2.6	2.5	1.9	1.8	2.0	2.8	3.0
5.0	3.0	3.4	2.9	3.9	4.0	3.4	3.7	3.9	3.7	5.2	4.3	4.0	3.9	3.8	4.1	3.6	3.3	4.2	4.8	3.9	3.9	3.1	3.4	3.5	3.3	3.5	4.0	3.8	3.7	4.2	5.1	3.7	4.5	4.7	4.4
6.0	4.7	4.6	4.5	4.3	4.5	4.1	3.9	4.1	3.8	4.0	4.5	5.1	4.4	3.8	4.2	4.6	4.0	3.7	4.5	4.5	4.6	4.5	4.8	4.2	3.8	3.5	3.4	3.3	3.8	5.2	5.5	5.4	4.8	4.9	5.2
4.3	4.1	4.4	4.5	4.2	4.0	4.1	4.1	4.2	3.7	4.5	4.3	4.7	4.0	4.2	4.5	4.4	4.2	4.3	4.8	4.4	3.8	4.2	4.8	5.0	4.2	3.9	4.3	4.5	4.3	4.4	4.5	5.1	4.6	4.6	4.4
3.6	3.6	3.8	3.8	3.7	3.7	3.9	4.1	3.9	3.7	3.8	3.7	3.3	3.3	3.4	3.5	3.8	3.7	3.5	3.5	3.4	3.2	3.1	3.0	3.1	3.1	3.1	3.3	3.2	3.2	3.2	3.2	3.6	3.5	3.5	3.8
3.2	3.0	3.0	3.3	3.3	3.1	3.4	3.3	3.0	3.2	3.0	2.7	2.5	2.7	2.9	2.8	3.0	3.3	3.0	2.8	2.6	2.5	2.5	2.5	2.6	2.8	2.9	2.9	2.6	2.6	2.7	2.9	2.6	2.6	2.7	2.9
2.8	2.9	2.6	2.5	2.8	2.9	2.8	2.6	2.5	2.5	2.5	2.8	2.3	2.3	2.3	2.4	2.6	2.6	2.5	2.2	2.2	2.1	2.5	3.0	2.6	2.4	2.9	3.5	3.9	3.4	3.4	3.6	2.8	2.5	2.4	2.6
2.2	2.2	2.3	2.5	3.0	3.5	3.0	2.9	2.9	2.8	2.1	2.2	2.1	2.2	2.2	2.4	3.1	3.7	4.1	4.6	5.1	4.6	3.8	3.0	4.6	4.6	3.4	2.9	2.6	2.7	2.8	2.5	2.5	2.6	3.2	2.3
4.1	3.6	3.5	3.1	2.7	2.4	2.1	1.5	1.4	1.8	2.4	2.8	3.0	3.1	3.0	2.1	1.7	1.4	1.4	1.4	1.8	2.0	2.2	2.3	2.5	2.7	2.5	2.1	1.7	1.5	1.4	1.6	1.8	2.4	4.4	4.4

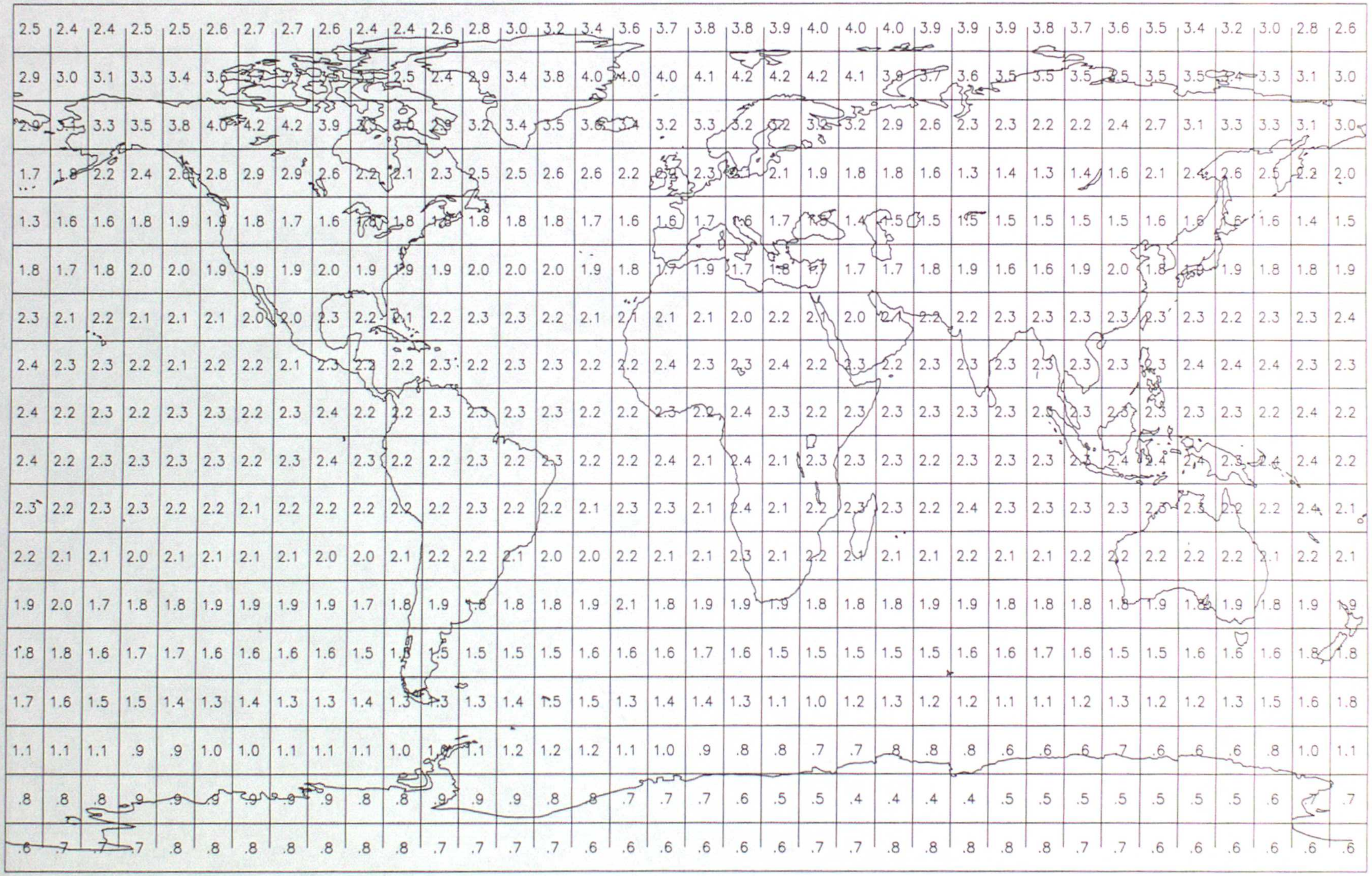
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
DECEMBER 2000 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 32


6.6 6.6 6.6 6.7 6.8 6.9 6.9 7.1 7.3 7.6 7.8 7.6 7.5 7.4 7.3 6.9 6.7 6.6 6.5 6.5 6.5 6.5 6.6 6.7 6.8 6.9 6.9 7.0 7.0 7.1 7.1 7.1 7.0 6.9 6.8 6.7
3.8 3.8 4.1 4.4 4.7 5.0 5.2 5.5 5.9 6.4 6.7 6.5 6.2 6.2 5.8 4.9 4.6 4.4 4.2 4.3 4.5 4.8 5.1 5.3 5.5 5.7 5.8 5.8 5.7 5.5 5.3 5.1 4.8 4.5 4.2 3.9
.5 1.7 1.2 1.9 2.6 3.4 4.0 4.3 4.6 4.7 4.6 4.1 3.5 3.4 3.0 2.6 2.5 2.3 2.4 2.5 2.4 2.6 3.0 3.3 3.6 4.1 4.4 4.7 4.6 4.1 3.5 2.9 2.1 1.4 1.0 .7
-1.9 -1.4 -.8 .2 1.1 2.0 2.5 2.7 2.7 2.6 2.2 1.4 1.1 1.1 .9 .7 .7 .9 1.5 1.6 1.6 1.9 1.6 2.2 2.5 2.7 3.1 3.3 3.1 2.9 2.1 1.4 .0 -.8 -1.3 -1.7
-1.6 -1.1 -.8 -.3 .4 1.1 1.4 1.7 1.7 1.4 .8 .3 .2 .2 .3 .4 .8 1.4 1.1 1.5 1.5 1.4 1.6 2.0 2.1 2.4 2.5 2.2 1.8 1.0 .2 -.4 -.9 -1.3 -1.4
-1.1 -.8 -.4 -.5 .0 .2 .2 .4 .6 .2 .2 -.3 -.3 -.1 -.1 .1 .1 .3 .4 .0 .6 .3 .4 .3 .6 .8 1.4 1.4 .6 .3 -.2 -.7 -1.1 -.8 -1.4 -.7
-2.1 -2.1 -1.5 -1.6 -1.2 -1.0 -1.1 -1.3 -1.1 -1.4 -1.8 -1.7 -1.7 -1.4 -1.3 -1.1 -1.2 -1.1 -1.2 -1.6 -1.1 -1.7 -1.4 -1.7 -1.6 -2.0 -2.1 -2.4 -2.5 -2.6 -2.5 -2.7 -3.0 -2.4 -3.0 -2.3
-3.2 -3.4 -3.0 -2.6 -2.2 -2.0 -2.1 -2.2 -2.1 -2.4 -2.8 -2.8 -2.8 -2.4 -2.2 -2.1 -2.1 -2.0 -2.6 -2.7 -2.7 -3.1 -2.8 -3.1 -3.0 -3.1 -3.4 -3.6 -3.5 -3.6 -3.4 -3.4 -3.7 -3.5 -3.8 -3.6
-3.3 -3.9 -3.4 -3.2 -2.9 -2.7 -2.7 -2.6 -2.4 -2.9 -3.1 -3.2 -3.1 -2.9 -2.5 -2.5 -2.5 -2.3 -3.2 -2.8 -3.0 -3.1 -3.1 -3.3 -3.2 -3.0 -3.3 -3.3 -3.3 -3.3 -3.4 -3.5 -3.6 -3.9 -3.7 -3.9
-3.4 -4.0 -3.4 -3.2 -3.0 -2.8 -2.7 -2.6 -2.6 -3.0 -3.2 -3.1 -3.0 -3.0 -2.6 -2.6 -2.6 -2.6 -3.3 -2.7 -3.1 -3.0 -3.1 -3.1 -3.1 -2.8 -3.2 -3.3 -3.2 -3.3 -3.5 -3.4 -3.5 -3.4 -3.3 -4.1
-3.6 -3.4 -3.1 -2.8 -2.7 -2.5 -2.3 -2.0 -2.2 -2.7 -3.0 -3.3 -3.1 -3.2 -2.6 -2.5 -2.4 -2.6 -3.4 -3.0 -3.7 -3.3 -3.2 -3.3 -3.5 -3.1 -3.8 -4.0 -4.1 -4.2 -4.3 -4.2 -4.1 -4.2 -3.6 -4.1
-3.1 -2.9 -3.1 -2.8 -2.8 -2.6 -2.4 -1.8 -2.0 -2.3 -2.9 -3.2 -3.5 -3.3 -2.8 -2.6 -2.3 -2.7 -3.0 -3.0 -3.3 -3.1 -3.1 -2.9 -3.2 -2.6 -3.2 -3.5 -3.7 -3.8 -4.0 -4.1 -3.7 -3.6 -2.9 -3.4
-3.0 -2.6 -3.1 -2.9 -3.1 -3.1 -2.8 -2.3 -2.4 -2.4 -2.6 -3.0 -3.1 -3.1 -3.1 -3.1 -2.6 -3.1 -2.7 -3.0 -3.1 -2.9 -3.0 -3.0 -3.1 -2.5 -2.7 -2.9 -2.9 -3.1 -3.1 -3.3 -3.0 -3.0 -2.8 -2.8
-3.8 -3.4 -3.7 -4.0 -4.0 -4.0 -3.6 -3.4 -3.5 -3.5 -3.5 -3.7 -3.9 -4.0 -4.1 -4.0 -3.9 -4.1 -3.8 -4.2 -4.3 -4.3 -4.3 -4.2 -4.2 -4.0 -3.9 -4.2 -4.3 -4.2 -4.1 -4.1 -4.1 -4.1 -4.0 -3.6
-5.6 -5.5 -5.4 -5.7 -5.7 -5.8 -5.6 -5.6 -5.8 -5.8 -5.8 -5.9 -6.0 -6.0 -6.0 -5.8 -5.8 -5.9 -5.9 -6.2 -6.3 -6.4 -6.5 -6.5 -6.4 -6.4 -6.3 -6.5 -6.6 -6.6 -6.5 -6.5 -6.6 -6.5 -6.3 -5.8
-7.7 -7.7 -7.7 -7.7 -7.8 -7.7 -7.8 -7.9 -7.9 -7.9 -7.7 -7.6 -7.4 -7.3 -7.3 -7.3 -7.3 -7.3 -7.5 -7.7 -7.8 -7.8 -7.8 -7.8 -7.8 -7.9 -7.8 -7.8 -7.9 -8.0 -7.9 -7.9 -8.0 -8.2 -8.2 -7.9
-8.9 -8.9 -9.0 -9.0 -9.0 -8.9 -9.0 -9.0 -9.0 -9.0 -9.0 -8.9 -8.8 -8.6 -8.6 -8.5 -8.4 -8.2 -8.1 -8.0 -8.1 -8.0 -7.8 -8.0 -8.3 -8.2 -7.9 -7.7 -7.9 -8.1 -8.1 -8.3 -8.6 -8.7 -8.9 -9.0
-9.8 -9.8 -9.9 -9.9 -9.8 -9.7 -9.6 -9.4 -9.4 -9.5 -9.6 -9.6 -9.5 -9.5 -9.4 -9.3 -9.2 -9.1 -9.0 -9.0 -8.9 -8.8 -8.6 -8.5 -8.4 -8.3 -8.4 -8.5 -8.7 -8.8 -9.0 -9.2 -9.3 -9.5 -9.6 -9.7

ATOVS : SD O−B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
DECEMBER 2000 : HIRS4 channel (400 hPa)
NOAA−15, USING ALL OBSERVATIONS

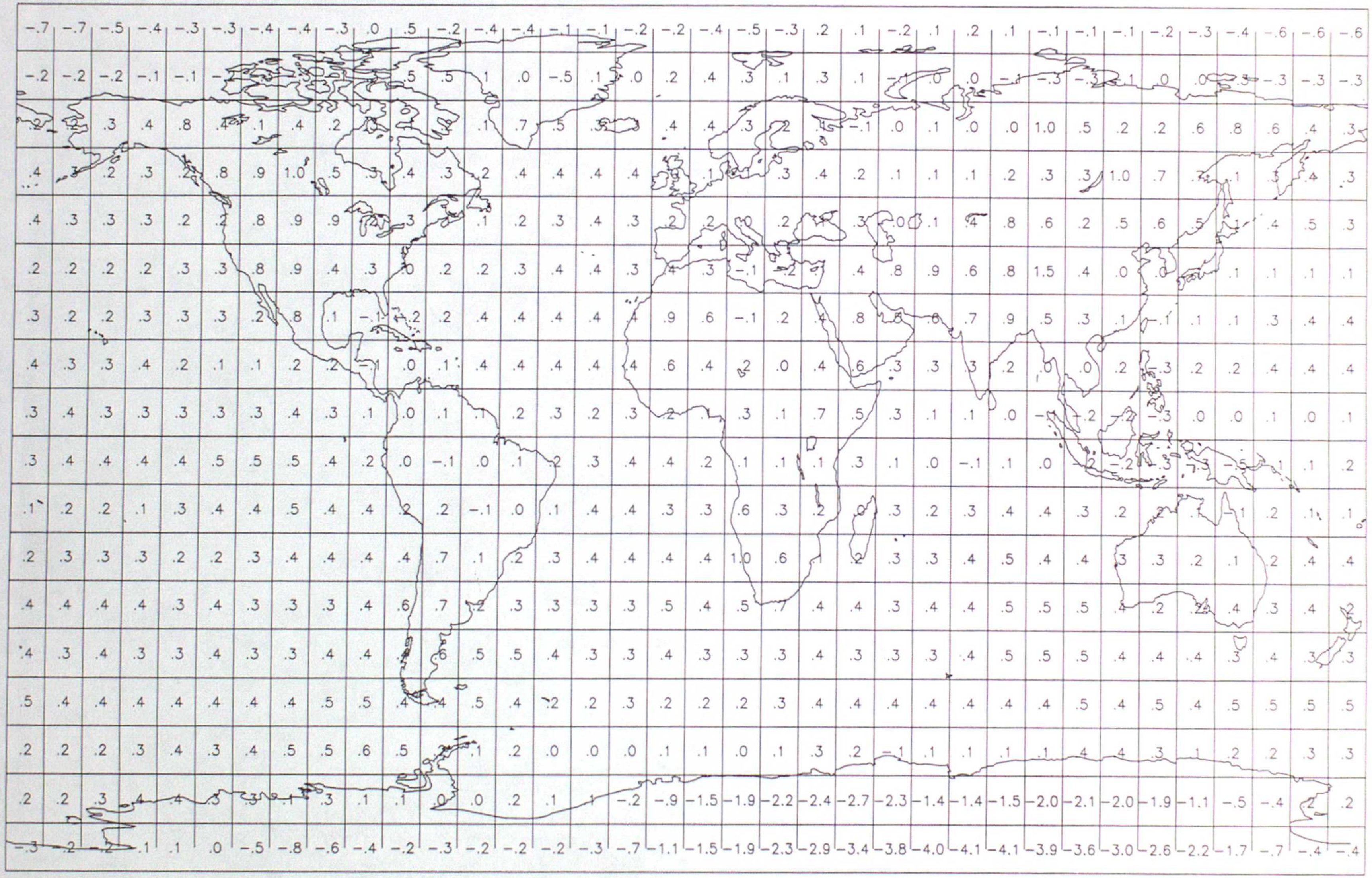
FIGURE 33



2.5	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.6	2.4	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.7	3.8	3.8	3.9	4.0	4.0	4.0	3.9	3.9	3.9	3.8	3.7	3.6	3.5	3.4	3.2	3.0	2.8	2.6
2.9	3.0	3.1	3.3	3.4	3.6	3.7	3.7	3.5	[illegible]	2.5	2.4	2.9	3.4	3.8	4.0	4.0	4.0	4.1	4.2	4.2	4.2	4.1	3.9	3.7	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.3	3.1	3.0
2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.2	3.9	[illegible]	3.0	2.9	3.2	3.4	3.5	3.6	3.4	3.2	3.3	3.2	3.2	3.2	3.2	2.9	2.6	2.3	2.3	2.2	2.2	2.4	2.7	3.1	3.3	3.3	3.1	3.0
1.7	1.8	2.2	2.4	2.6	2.8	2.9	2.9	2.6	2.2	2.1	2.3	2.5	2.5	2.6	2.6	2.2	[illegible]	2.3	[illegible]	2.1	1.9	1.8	1.8	1.6	1.3	1.4	1.3	1.4	1.6	2.1	2.4	2.6	2.5	2.2	2.0
1.3	1.6	1.6	1.8	1.9	1.9	1.8	1.7	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.6	1.7	1.6	1.7	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.4	1.5
1.8	1.7	1.8	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.8	1.7	1.9	1.7	1.8	1.7	1.7	1.7	1.8	1.9	1.6	1.6	1.9	2.0	1.8	1.9	1.9	1.8	1.8	1.9
2.3	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.3	2.2	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.2	2.1	2.0	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.4
2.4	2.3	2.3	2.2	2.1	2.2	2.2	2.1	2.3	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.4	2.3	2.3	2.4	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3
2.4	2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.4	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.2
2.4	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.4	2.1	2.4	2.1	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.4	2.2
2.3	2.2	2.3	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.3	2.3	2.1	2.4	2.1	2.2	2.3	2.3	2.2	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.4	2.1
2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.2	2.1	2.0	2.0	2.2	2.1	2.1	2.3	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1
1.9	2.0	1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.7	1.8	1.9	1.8	1.8	1.8	1.9	2.1	1.8	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.8	1.9	1.9
1.8	1.8	1.6	1.7	1.7	1.6	1.6	1.6	1.6	1.5	[illegible]	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.6	1.5	1.5	1.6	1.6	1.6	1.8	1.8
1.7	1.6	1.5	1.5	1.4	1.3	1.4	1.3	1.3	1.4	1.3	1.3	1.3	1.4	1.5	1.5	1.3	1.4	1.4	1.3	1.1	1.0	1.2	1.3	1.2	1.2	1.1	1.1	1.2	1.3	1.2	1.2	1.3	1.5	1.6	1.8
1.1	1.1	1.1	.9	.9	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.2	1.2	1.2	1.1	1.0	.9	.8	.8	.7	.7	.8	.8	.8	.6	.6	.6	.7	.6	.6	.6	.8	1.0	1.1
.8	.8	.8	.9	.9	.9	.9	.9	.9	.8	.8	.9	.9	.9	.8	.8	.7	.7	.7	.6	.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.6	.7	.7
.6	.7	.7	.7	.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.7	.6	.6	.6	.6	.6	.6	.7	.7	.8	.8	.8	.8	.8	.7	.7	.6	.6	.6	.6	.6	.6

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
DECEMBER 2000 : AMSUA-5 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

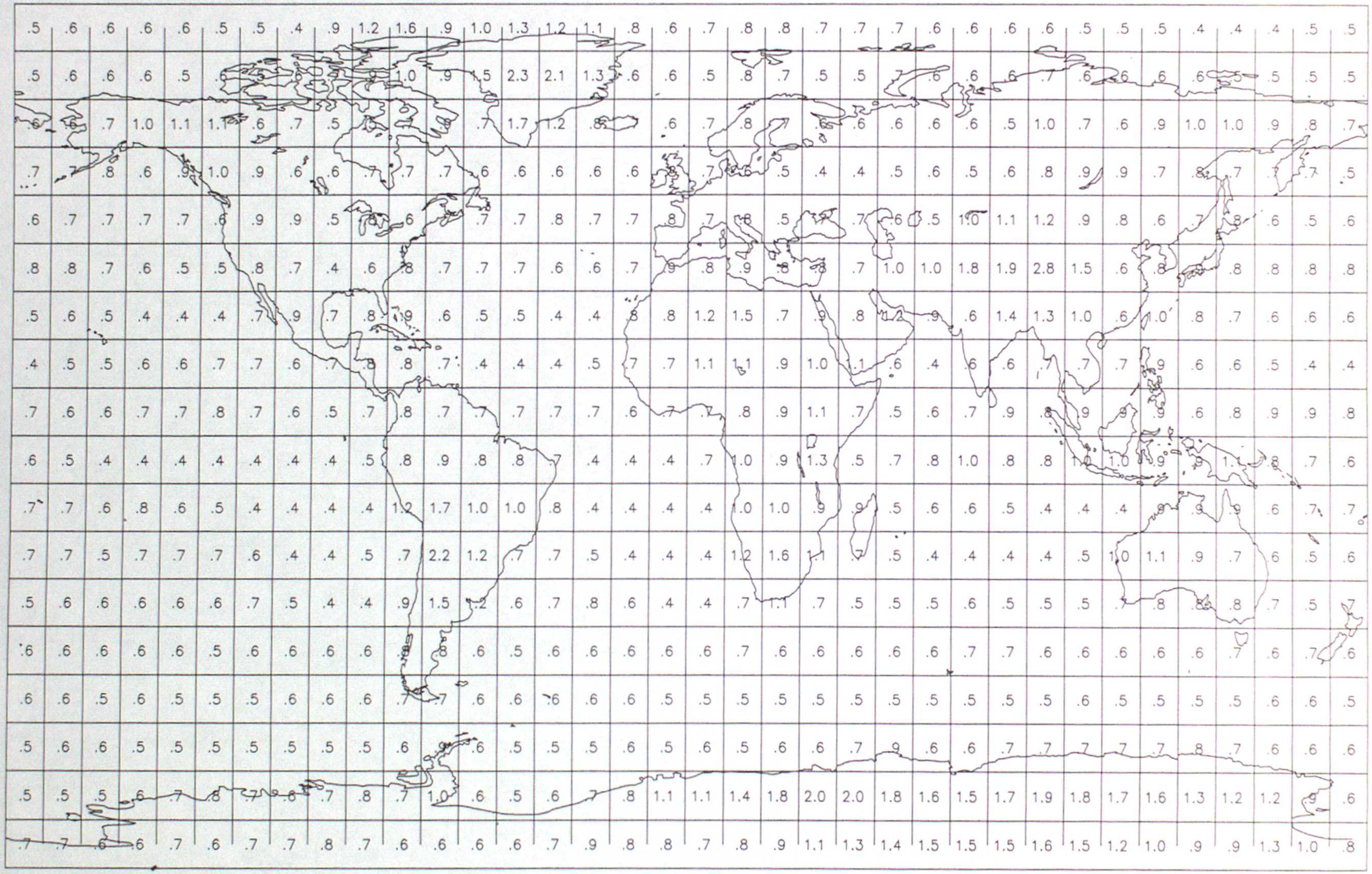
FIGURE 34



-.7	-.7	-.5	-.4	-.3	-.3	-.4	-.4	-.3	.0	.5	-.2	-.4	-.4	-.1	-.1	-.2	-.2	-.4	-.5	-.3	.2	.1	-.2	.1	.2	.1	-.1	-.1	-.1	-.2	-.3	-.4	-.6	-.6	-.6
-.2	-.2	-.2	-.1	-.1	[illegible]	[illegible]	.5	[illegible]	[illegible]	.5	.5	.1	.0	-.5	.1	.0	.2	.4	.3	.1	.3	.1	-.1	.0	.0	-.1	-.3	-.3	-.1	.0	.0	-.3	-.3	-.3	-.3
.2	.2	.3	.4	.8	.4	.1	.4	.2	[illegible]	[illegible]	.2	.1	.7	.5	.3	.3	.4	.4	.3	.2	.1	-.1	.0	.1	.0	.0	1.0	.5	.2	.2	.6	.8	.6	.4	.3
.4	.3	.2	.3	.2	.8	.9	1.0	.5	.3	.4	.3	.2	.4	.4	.4	.4	[illegible]	.1	.1	.3	.4	.2	.1	.1	.1	.2	.3	.3	1.0	.7	.7	.1	.3	.4	.3
.4	.3	.3	.3	.2	.2	.8	.9	.9	.4	.3		.1	.2	.3	.4	.3	.2	.2	.0	.2	.1	.3	.0	.1	.4	.8	.6	.2	.5	.6	.5	.1	.4	.5	.3
.2	.2	.2	.2	.3	.3	.8	.9	.4	.3	.0	.2	.2	.3	.4	.4	.3	.4	.3	-.1	.2	[illegible]	.4	.8	.9	.6	.8	1.5	.4	.0	.0		.1	.1	.1	.1
.3	.2	.2	.3	.3	.3	.2	.8	.1	-.1	.2	.2	.4	.4	.4	.4	.4	.9	.6	-.1	.2	.4	.8	.8	.6	.7	.9	.5	.3	.1	-.1	.1	.1	.3	.4	.4
.4	.3	.3	.4	.2	.1	.1	.2	.2	-.1	.0	.1	.4	.4	.4	.4	.4	.6	.4	.2	.0	.4	.6	.3	.3	.3	.2	.0	.0	.2	-.3	.2	.2	.4	.4	.4
.3	.4	.3	.3	.3	.3	.3	.4	.3	.1	.0	.1	.1	.2	.3	.2	.3	.2	.1	.3	.1	.7	.5	.3	.1	.1	.0	-.1	-.2	-.2	-.3	.0	.0	.1	.0	.1
.3	.4	.4	.4	.4	.5	.5	.5	.4	.2	.0	-.1	.0	.1	.2	.3	.4	.4	.2	.1	.1	.1	.3	.1	.0	-.1	.1	.0	-.2	-.2	-.3	-.3	-.5	.1	.1	.2
.1	.2	.2	.1	.3	.4	.4	.5	.4	.4	.2	.2	-.1	.0	.1	.4	.4	.3	.3	.6	.3	.2	.0	.3	.2	.3	.4	.4	.3	.2	.2	.1	-.1	.2	.1	.1
.2	.3	.3	.3	.2	.2	.3	.4	.4	.4	.4	.7	.1	.2	.3	.4	.4	.4	.4	1.0	.6	.1	.2	.3	.3	.4	.5	.4	.4	.3	.3	.2	.1	.2	.4	.4
.4	.4	.4	.4	.3	.4	.3	.3	.3	.4	.6	.7	.2	.3	.3	.3	.3	.5	.4	.5	.7	.4	.4	.3	.4	.4	.5	.5	.5	.4	.2	.2	.4	.3	.4	.2
.4	.3	.4	.3	.3	.4	.3	.3	.4	.4	.4	.6	.5	.5	.4	.3	.3	.4	.3	.3	.3	.4	.3	.3	.3	.4	.5	.5	.5	.4	.4	.4	.3	.4	.3	.3
.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.5	.4	.2	.2	.3	.2	.2	.2	.3	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.4	.5	.5	.5	.5
.2	.2	.2	.3	.4	.3	.4	.5	.5	.6	.5	.2	.1	.2	.0	.0	.0	.1	.1	.0	.1	.3	.2	-.1	.1	.1	.1	.1	.4	.4	.3	.1	.2	.2	.3	.3
.2	.2	.3	.4	.4	.3	.3	.1	.3	.1	.1	.0	.0	.2	.1	.1	-.2	-.9	-1.5	-1.9	-2.2	-2.4	-2.7	-2.3	-1.4	-1.4	-1.5	-2.0	-2.1	-2.0	-1.9	-1.1	-.5	-.4	.2	.2
-.3	-.2	-.2	.1	.1	.0	-.5	-.8	-.6	-.4	-.2	-.3	-.2	-.2	-.2	-.3	-.7	-1.1	-1.5	-1.9	-2.3	-2.9	-3.4	-3.8	-4.0	-4.1	-4.1	-3.9	-3.6	-3.0	-2.6	-2.2	-1.7	-.7	-.4	-.4

ATOVS : SD O−B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
DECEMBER 2000 : AMSUA−5 channel (700 hPa)
NOAA−15, USING ALL OBSERVATIONS

FIGURE 35



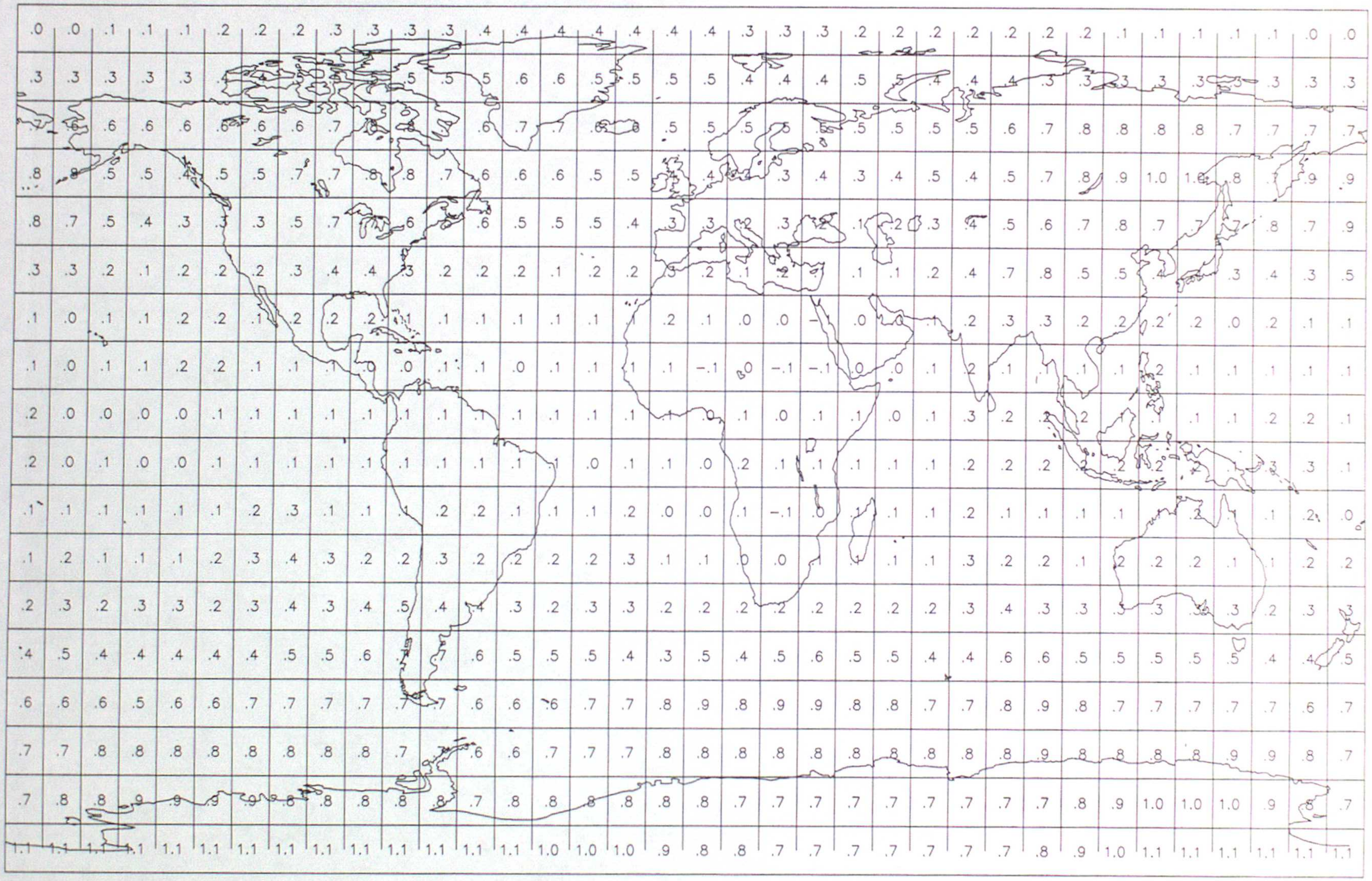
.5	.6	.6	.6	.6	.5	.5	.4	.9	1.2	1.6	.9	1.0	1.3	1.2	1.1	.8	.6	.7	.8	.8	.7	.7	.7	.6	.6	.6	.6	.5	.5	.5	.4	.4	.4	.5	.5
.5	.6	.6	.6	.5	.6	.5	.6		.9	1.0	.9	1.5	2.3	2.1	1.3	.6	.6	.5	.8	.7	.5	.5	.7	.6	.6	.6	.7	.6	.6	.6	.6	.5	.5	.5	.5
.6	.6	.7	1.0	1.1	1.1	.6	.7	.5	.6	.7	.8	.7	1.7	1.2	.8		.6	.7	.8	.7	.6	.6	.6	.6	.6	.5	1.0	.7	.6	.9	1.0	1.0	.9	.8	.7
.7	.7	.8	.6	.9	1.0	.9	.6	.6	.7	.7	.7	.6	.6	.6	.6	.6	.8	.7	.6	.5	.4	.4	.5	.6	.5	.6	.8	.9	.9	.7	.8	.7	.7	.7	.5
.6	.7	.7	.7	.7	.6	.9	.9	.5	.8	.6		.7	.7	.8	.7	.7	.8	.7	.8	.5	.7	.7	.6	.5	1.0	1.1	1.2	.9	.8	.6	.7	.8	.6	.5	.6
.8	.8	.7	.6	.5	.5	.8	.7	.4	.6	.8	.7	.7	.7	.6	.6	.7	.9	.8	.9	.8	.8	.7	1.0	1.0	1.8	1.9	2.8	1.5	.6	.8		.8	.8	.8	.8
.5	.6	.5	.4	.4	.4	.7	.9	.7	.8	.9	.6	.5	.5	.4	.4	.8	.8	1.2	1.5	.7	.9	.8	1.2	.9	.6	1.4	1.3	1.0	.6	1.0	.8	.7	.6	.6	.6
.4	.5	.5	.6	.6	.7	.7	.6	.7	.8	.8	.7	.4	.4	.4	.5	.7	.7	1.1	1.1	.9	1.0	1.1	.6	.4	.6	.6	.7	.7	.7	.9	.6	.6	.5	.4	.4
.7	.6	.6	.7	.7	.8	.7	.6	.5	.7	.8	.7	.7	.7	.7	.7	.6	.7	.7	.8	.9	1.1	.7	.5	.6	.7	.9	.8	.9	.9	.9	.6	.8	.9	.9	.8
.6	.5	.4	.4	.4	.4	.4	.4	.4	.5	.8	.9	.8	.8	.7	.4	.4	.4	.7	1.0	.9	1.3	.5	.7	.8	1.0	.8	.8	1.0	1.0	.9	.9	1.1	.8	.7	.6
.7	.7	.6	.8	.6	.5	.4	.4	.4	.4	1.2	1.7	1.0	1.0	.8	.4	.4	.4	.4	1.0	1.0	.9	.9	.5	.6	.6	.5	.4	.4	.4	.9	.9	.9	.6	.7	.7
.7	.7	.5	.7	.7	.7	.6	.4	.4	.5	.7	2.2	1.2	.7	.7	.5	.4	.4	.4	1.2	1.6	1.1	.7	.5	.4	.4	.4	.4	.5	1.0	1.1	.9	.7	.6	.5	.6
.5	.6	.6	.6	.6	.6	.7	.5	.4	.4	.9	1.5	1.2	.6	.7	.8	.6	.4	.4	.7	1.1	.7	.5	.5	.5	.6	.5	.5	.5	.7	.8	.8	.8	.7	.5	.7
.6	.6	.6	.6	.6	.5	.6	.6	.6	.6	.8	.8	.6	.5	.6	.6	.6	.6	.6	.7	.6	.6	.6	.6	.6	.7	.7	.6	.6	.6	.6	.6	.7	.6	.7	.6
.6	.6	.5	.6	.5	.5	.5	.6	.6	.6	.7	.7	.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.6	.6	.5
.5	.6	.6	.5	.5	.5	.5	.5	.5	.5	.6	.9	.6	.5	.5	.5	.6	.5	.6	.5	.6	.6	.7	.9	.6	.6	.7	.7	.7	.7	.7	.8	.7	.6	.6	.6
.5	.5	.5	.6	.7	.8	.7	.6	.7	.8	.7	1.0	.6	.5	.6	.7	.8	1.1	1.1	1.4	1.8	2.0	2.0	1.8	1.6	1.5	1.7	1.9	1.8	1.7	1.6	1.3	1.2	1.2	.9	.6
.7	.7	.6	.6	.7	.6	.7	.7	.8	.7	.6	.6	.6	.6	.7	.9	.8	.8	.7	.8	.9	1.1	1.3	1.4	1.5	1.5	1.5	1.6	1.5	1.2	1.0	.9	.9	1.3	1.0	.8

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

DECEMBER 2000 : AMSUA-7 Channel (300 hPa)

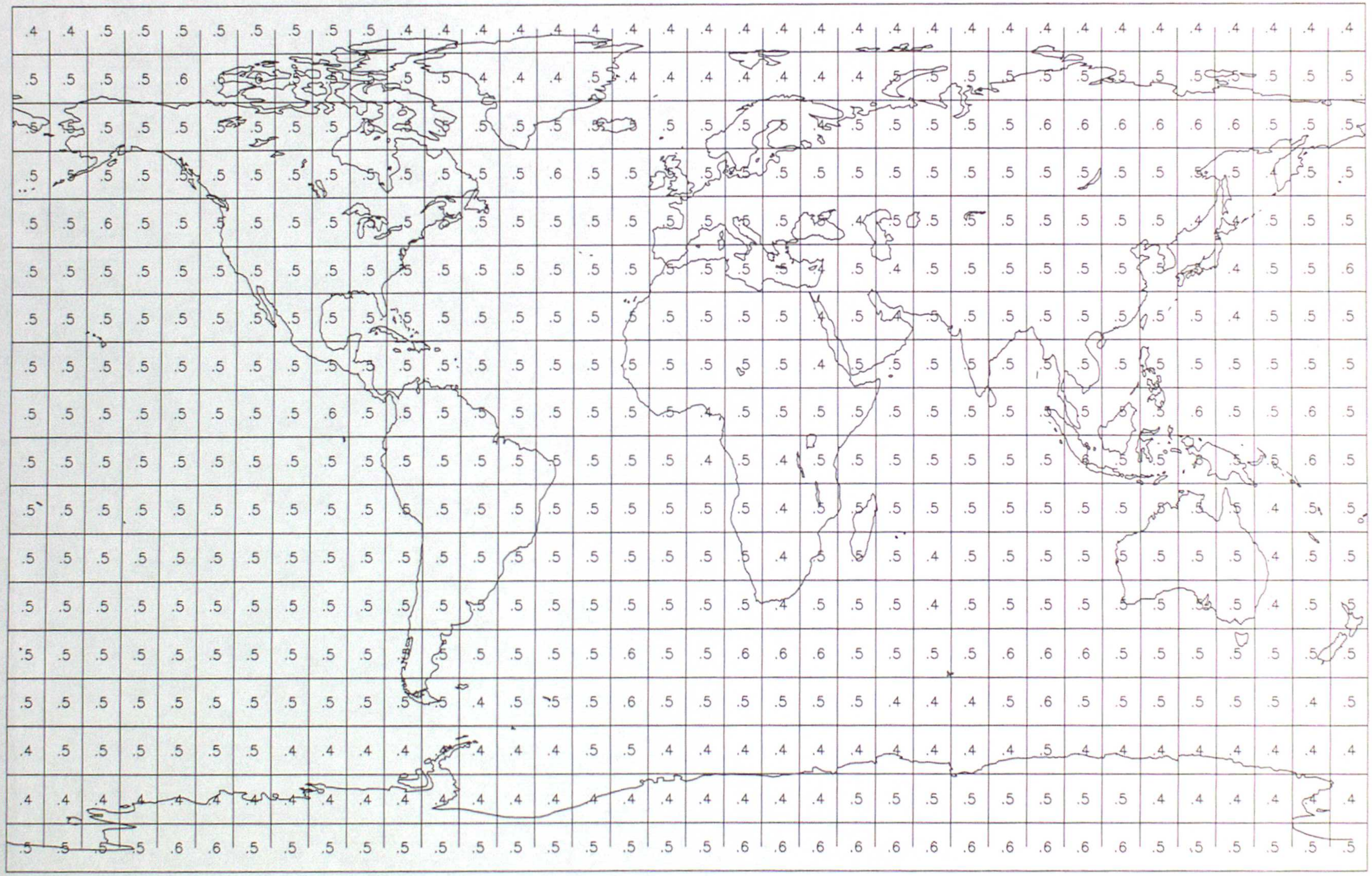
NOAA-15, USING ALL OBSERVATIONS

FIGURE 36



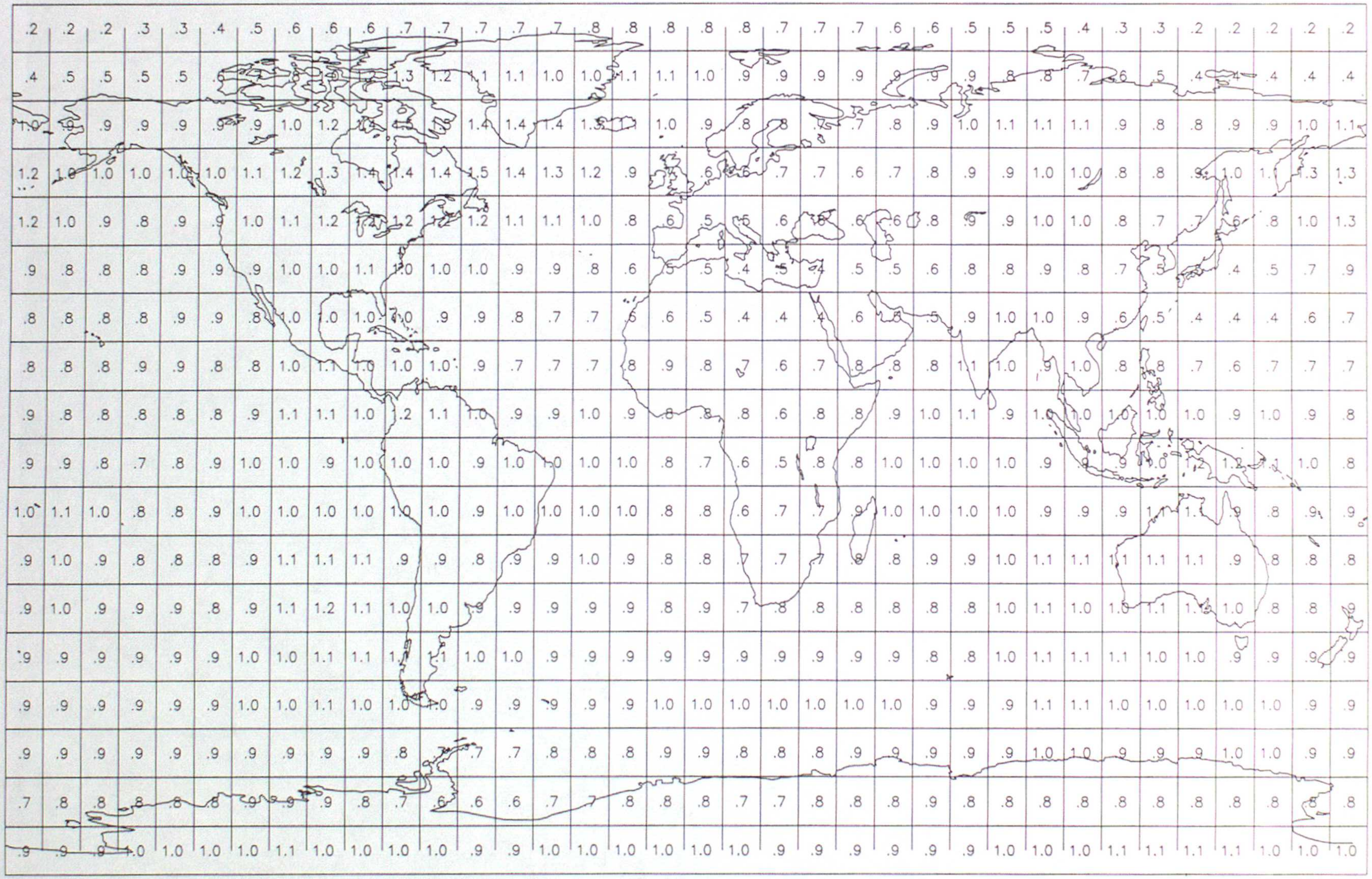
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
DECEMBER 2000 : AMSUA-7 channel (300 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 37


.4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .6 .6 .6 .5 [illegible] [illegible] .5 .5 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .6
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .6 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .6 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .6 .6 .6 .5 .5 .5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .6 .5 .5 .5 .5 .5 .5 .4 .5
.4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
DECEMBER 2000 : AMSUA–9 Channel (100 hPa)
NOAA–15, USING ALL OBSERVATIONS

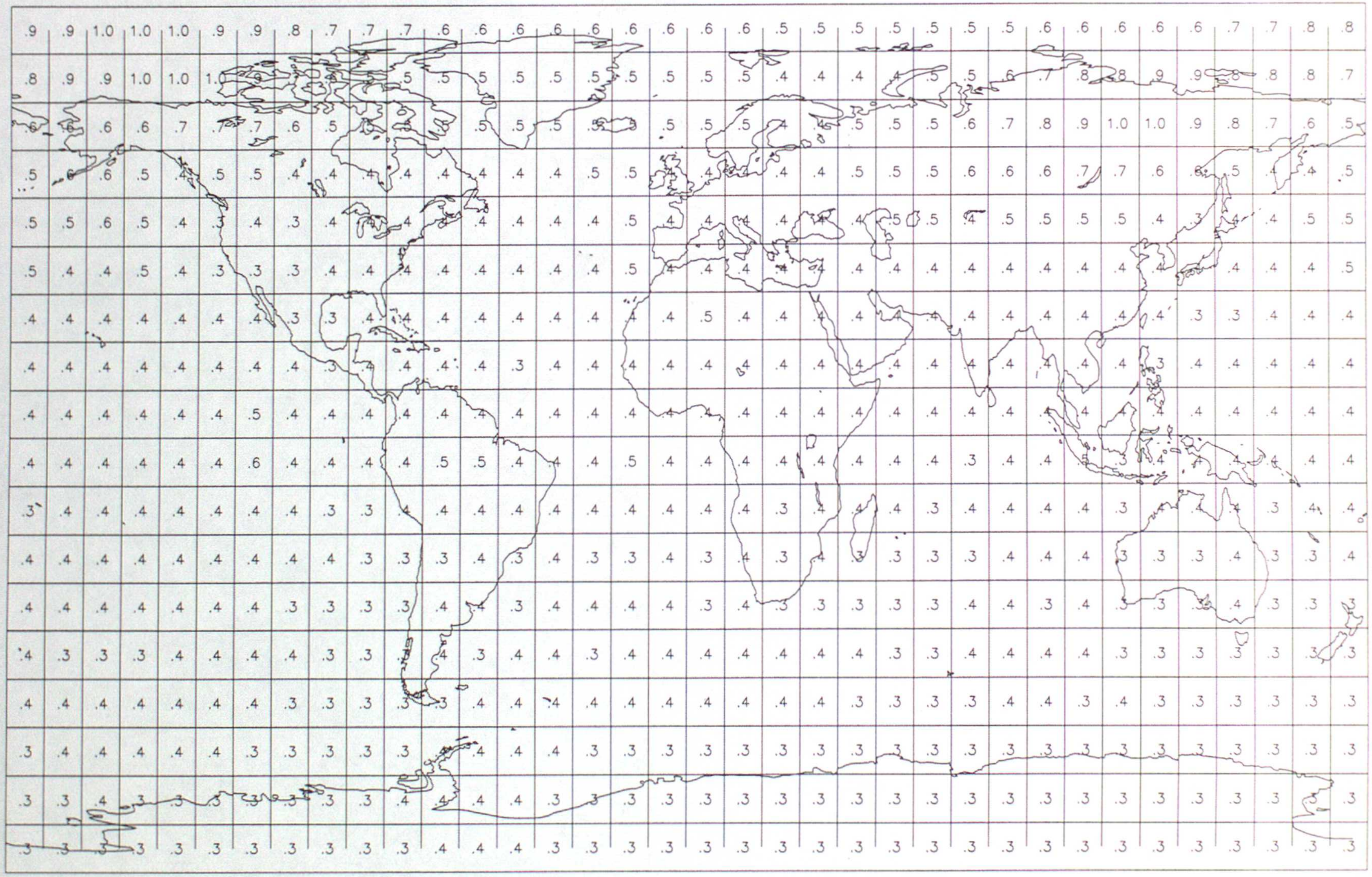
FIGURE 38



.2	.2	.2	.3	.3	.4	.5	.6	.6	.6	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.7	.7	.7	.6	.6	.5	.5	.5	.4	.3	.3	.2	.2	.2	.2	.2
.4	.5	.5	.5	.5	.6	.7	[illegible]	[illegible]	[illegible]	1.3	1.2	1.1	1.1	1.0	1.0	1.1	1.1	1.0	.9	.9	.9	.9	.9	.9	.9	.8	.8	.7	.6	.5	.4	.4	.4	.4	.4
1.0	.9	.9	.9	.9	.9	.9	1.0	1.2	1.4	1.5	1.5	1.4	1.4	1.4	1.3	1.1	1.0	.9	.8	.8	.7	.7	.8	.9	1.0	1.1	1.1	1.1	.9	.8	.8	.9	.9	1.0	1.1
1.2	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.4	1.5	1.4	1.3	1.2	.9	[illegible]	.6	.6	.7	.7	.6	.7	.8	.9	.9	1.0	1.0	.8	.8	.9	1.0	1.1	1.3	1.3
1.2	1.0	.9	.8	.9	.9	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.0	.8	.6	.5	.5	.6	.6	.6	.6	.8	.9	.9	1.0	1.0	.8	.7	.7	.6	.8	1.0	1.3
.9	.8	.8	.8	.9	.9	.9	1.0	1.0	1.1	1.0	1.0	1.0	.9	.9	.8	.6	.5	.5	.4	.5	.4	.5	.5	.6	.8	.8	.9	.8	.7	.5		.4	.5	.7	.9
.8	.8	.8	.8	.9	.9	.8	1.0	1.0	1.0	1.0	.9	.9	.8	.7	.7	.6	.6	.5	.4	.4	.4	.6	.8	.5	.9	1.0	1.0	.9	.6	.5	.4	.4	.4	.6	.7
.8	.8	.8	.9	.9	.8	.8	1.0	1.1	1.0	1.0	1.0	.9	.7	.7	.7	.8	.9	.8	.7	.6	.7	.8	.8	.8	1.1	1.0	.9	1.0	.8	.8	.7	.6	.7	.7	.7
.9	.8	.8	.8	.8	.8	.9	1.1	1.1	1.0	1.2	1.1	1.0	.9	.9	1.0	.9	.8	.8	.8	.6	.8	.8	.9	1.0	1.1	.9	1.0	1.0	1.0	1.0	1.0	.9	1.0	.9	.8
.9	.9	.8	.7	.8	.9	1.0	1.0	.9	1.0	1.0	1.0	.9	1.0	1.0	1.0	1.0	.8	.7	.6	.5	.8	.8	1.0	1.0	1.0	1.0	.9	.9	.9	1.0	1.2	1.2	1.1	1.0	.8
1.0	1.1	1.0	.8	.8	.9	1.0	1.0	1.0	1.0	1.0	1.0	.9	1.0	1.0	1.0	1.0	.8	.8	.6	.7	.7	.9	1.0	1.0	1.0	1.0	.9	.9	.9	1.1	1.1	.9	.8	.9	.9
.9	1.0	.9	.8	.8	.8	.9	1.1	1.1	1.1	.9	.9	.8	.9	.9	1.0	.9	.8	.8	.7	.7	.7	.8	.8	.9	.9	1.0	1.1	1.1	1.1	1.1	1.1	.9	.8	.8	.8
.9	1.0	.9	.9	.9	.8	.9	1.1	1.2	1.1	1.0	1.0	.9	.9	.9	.9	.9	.8	.9	.7	.8	.8	.8	.8	.8	.8	1.0	1.1	1.0	1.0	1.1	1.1	1.0	.8	.8	.9
.9	.9	.9	.9	.9	.9	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.8	.8	1.0	1.1	1.1	1.1	1.0	1.0	.9	.9	.9	.9
.9	.9	.9	.9	.9	.9	1.0	1.0	1.1	1.0	1.0	1.0	.9	.9	.9	.9	.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.9	.9	.9	1.1	1.1	1.0	1.0	1.0	1.0	1.0	.9	.9
.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.8	.7	.7	.7	.8	.8	.8	.9	.9	.8	.8	.8	.9	.9	.9	.9	.9	1.0	1.0	.9	.9	.9	1.0	1.0	.9	.9
.7	.8	.8	.8	.8	.8	.9	.9	.9	.8	.7	.6	.6	.6	.7	.7	.8	.8	.8	.7	.7	.8	.8	.8	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
.9	.9	.9	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	.9	.9	1.0	1.0	1.0	1.0	1.0	1.0	.9	.9	.9	.9	.9	.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0

ATOVS : SD O−B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
DECEMBER 2000 : AMSUA−9 channel (100 hPa)
NOAA−15, USING ALL OBSERVATIONS

FIGURE 39



.9	.9	1.0	1.0	1.0	.9	.9	.8	.7	.7	.7	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.7	.7	.8	.8
.8	.9	.9	1.0	1.0	1.0	.9	[illegible]	.4	[illegible]	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.5	.5	.6	.7	.8	.8	.9	.9	.8	.8	.8	.7
.6	.6	.6	.6	.7	.7	.7	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.5	.5	.5	.6	.7	.8	.9	1.0	1.0	.9	.8	.7	.6	.5
.5	.6	.6	.5	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.5	.5	.5	.6	.6	.6	.7	.7	.6	.6	.5	.4	.4	.5
.5	.5	.6	.5	.4	.3	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.5	.5	.4	.5	.5	.5	.5	.4	.3	.4	.4	.5	.5
.5	.4	.4	.5	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5
.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.6	.4	.4	.4	.4	.5	.5	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.5	.3	.4	.4	.4	.4	.4	.4
.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.3	.4	.4	.4	.4	.3	.4	.4	.4	.3	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.4	.3	.4	.3	.3	.4	.3	.4	.3	.4	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.4	.3	.3	.4
.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.3	.4	.4	.4	.4	.3	.4	.3	.3	.3	.3	.3	.4	.4	.3	.4	.3	.3	.3	.4	.3	.3	.3
.4	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.4	.3	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3
.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.3	.4	.3	.3	.3	.3	.3	.3
.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures
Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
23925	44.7	-63.6	ALL	P	SUR	50	0	0	0.6	-6.0	6.0
41501	27.0	-77.0	ALL	P	SUR	338	0	0	0.7	0.4	0.8
41502	24.6	-77.7	ALL	P	SUR	180	0	0	0.7	0.7	1.0
41503	30.6	-76.9	ALL	P	SUR	203	0	0	1.0	0.6	1.2
41504	22.3	-68.9	ALL	P	SUR	188	0	0	0.9	0.2	0.9
41505	25.6	-65.9	ALL	P	SUR	201	0	0	1.2	-0.8	1.4
41506	20.4	-71.1	ALL	P	SUR	170	0	0	0.8	0.3	0.9
41521	29.1	-68.1	ALL	P	SUR	297	0	0	0.8	0.2	0.8
41523	26.5	-61.1	ALL	P	SUR	354	0	0	0.7	0.1	0.7
41524	18.2	-72.1	ALL	P	SUR	42	0	0	1.9	4.6	4.9
41571	31.2	-55.8	ALL	P	SUR	190	0	0	0.8	0.4	0.9
41572	21.8	-49.3	ALL	P	SUR	519	0	0	0.7	-0.2	0.7
41590	19.3	-61.2	ALL	P	SUR	524	0	0	0.6	0.4	0.7
41594	19.0	-76.1	ALL	P	SUR	530	0	0	0.7	0.5	0.9
41595	15.3	-74.8	ALL	P	SUR	529	1	0	0.6	0.3	0.7
41611	15.1	-65.4	ALL	P	SUR	544	0	0	0.5	0.4	0.6
41613	17.8	-41.2	ALL	P	SUR	503	0	0	0.7	0.2	0.7
41615	16.9	-53.9	ALL	P	SUR	10	0	0	0.3	0.0	0.3
41616	20.5	-51.9	ALL	P	SUR	543	0	0	0.5	0.2	0.6
41639	18.5	-61.2	ALL	P	SUR	227	0	0	0.6	0.9	1.1
41642	19.9	-64.8	ALL	P	SUR	252	0	0	0.5	0.0	0.5
41644	31.0	-47.8	ALL	P	SUR	363	2	1	1.3	0.4	1.4
44546	57.7	-34.6	ALL	P	SUR	611	3	0	1.7	0.8	1.9
44548	49.1	-47.3	ALL	P	SUR	520	3	1	2.2	0.8	2.4
44608	26.2	-31.7	ALL	P	SUR	1880	1	0	0.6	0.2	0.7
44610	49.9	-25.5	ALL	P	SUR	1722	24	1	1.9	-0.1	1.9
44611	43.5	-11.2	ALL	P	SUR	671	2	0	1.2	0.6	1.3
44612	37.3	-38.3	ALL	P	SUR	703	0	0	1.0	0.3	1.1
44613	31.6	-52.4	ALL	P	SUR	724	1	0	0.7	0.1	0.7
44617	47.0	-3.6	ALL	P	SUR	250	0	0	0.8	0.3	0.8
44620	31.4	-44.4	ALL	P	SUR	670	1	0	1.0	0.3	1.0
44622	54.5	-15.2	ALL	P	SUR	685	0	0	1.0	0.0	1.0
44623	35.9	-30.1	ALL	P	SUR	658	3	0	1.3	0.7	1.5
44626	38.1	-9.2	ALL	P	SUR	428	2	0	0.9	0.4	1.0
44628	35.4	-26.6	ALL	P	SUR	1052	14	1	1.0	0.0	1.0
44723	46.8	-13.3	ALL	P	SUR	702	0	0	0.9	-0.8	1.2
44724	37.0	-23.9	ALL	P	SUR	837	0	0	0.9	0.1	0.9
44725	49.8	-43.0	ALL	P	SUR	646	0	0	1.3	-0.8	1.5
44726	33.7	-58.5	ALL	P	SUR	584	0	0	0.7	0.3	0.8
44727	30.0	-36.9	ALL	P	SUR	672	0	0	0.6	-0.7	0.9
44729	47.3	-20.3	ALL	P	SUR	656	1	0	1.3	0.0	1.3
44730	53.1	-10.4	ALL	P	SUR	456	0	0	2.1	0.3	2.1
44737	41.8	-60.9	ALL	P	SUR	1	0	0	0.0	-2.5	2.5
44741	59.1	-35.1	ALL	P	SUR	681	0	0	0.7	0.1	0.7
44743	46.5	-6.1	ALL	P	SUR	1424	5	0	0.9	0.4	1.0
44761	50.6	-29.3	ALL	P	SUR	694	0	0	1.1	-0.6	1.3
44762	44.6	-15.1	ALL	P	SUR	375	0	0	0.9	-0.1	0.9
44765	35.2	-53.0	ALL	P	SUR	603	6	1	0.8	0.1	0.8
44770	50.0	-26.1	ALL	P	SUR	659	0	0	1.3	-0.1	1.3
44771	53.4	-35.9	ALL	P	SUR	576	0	0	1.3	-0.2	1.3
44772	45.1	-14.4	ALL	P	SUR	1397	6	0	1.1	-0.6	1.2
44774	47.3	-35.0	ALL	P	SUR	1149	7	1	1.3	-0.8	1.5
44775	40.8	-60.0	ALL	P	SUR	683	0	0	1.3	0.0	1.3
44776	43.1	-48.0	ALL	P	SUR	697	3	0	1.3	0.7	1.5
44778	39.7	-50.4	ALL	P	SUR	681	1	0	1.4	1.0	1.7
44807	43.5	-70.1	ALL	P	SUR	1	0	0	0.0	-4.6	4.6
44813	42.4	-70.7	ALL	P	SUR	1	0	0	0.0	-2.3	2.3
45735	43.8	-76.9	ALL	P	SUR	2	1	50	0.0	0.1	0.1
47555	69.3	-64.4	ALL	P	SUR	360	0	0	1.2	0.8	1.4
48581	74.9	-75.4	ALL	P	SUR	440	0	0	1.0	-0.9	1.3

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62507	35.7	-22.3	ALL	P	SUR	1130	5	0	0.9	-0.3	0.9
62508	34.8	-13.6	ALL	P	SUR	809	0	0	1.5	-0.6	1.6
62509	44.5	-3.7	ALL	P	SUR	1258	0	0	1.0	-0.8	1.2
62512	41.6	-18.0	ALL	P	SUR	148	0	0	1.0	0.5	1.1
62513	46.0	-22.1	ALL	P	SUR	339	0	0	2.7	0.6	2.7
62514	53.8	-17.4	ALL	P	SUR	648	3	0	2.0	0.3	2.0
62516	44.5	-22.3	ALL	P	SUR	364	3	1	1.1	-0.3	1.1
62517	36.5	-17.8	ALL	P	SUR	659	0	0	0.9	-0.3	1.0
62519	43.5	-14.9	ALL	P	SUR	651	0	0	0.9	-0.9	1.3
62520	32.7	-25.4	ALL	P	SUR	760	7	1	0.8	-0.4	0.9
62596	58.8	-27.4	ALL	P	SUR	591	0	0	0.9	-0.5	1.1
62609	57.0	0.0	ALL	P	SUR	1	0	0	0.0	-0.8	0.8
62706	57.0	-9.9	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
62709	57.0	0.0	ALL	P	SUR	1	0	0	0.0	-2.0	2.0
62758	49.5	-5.9	ALL	P	SUR	32	0	0	0.7	-0.2	0.7
63661	79.7	-2.2	ALL	P	SUR	109	0	0	1.8	0.3	1.8
63662	76.3	-8.2	ALL	P	SUR	174	0	0	1.5	0.5	1.6
64517	56.6	-16.7	ALL	P	SUR	1181	0	0	0.9	-0.8	1.2
64546	49.1	-6.4	ALL	P	SUR	104	82	79	3.4	13.1	13.6
64548	58.1	-14.1	ALL	P	SUR	1412	19	1	1.2	-0.8	1.4
64698	58.5	-31.3	ALL	P	SUR	1120	0	0	0.9	-0.8	1.2
64699	56.2	-49.5	ALL	P	SUR	1088	157	14	4.4	0.8	4.5
65593	60.8	-30.9	ALL	P	SUR	1907	1	0	1.0	-0.8	1.2
65599	59.5	-20.9	ALL	P	SUR	80	3	4	2.1	-0.9	2.3
65600	58.1	-10.4	ALL	P	SUR	1888	6	0	0.8	-0.7	1.1
65601	59.1	-25.1	ALL	P	SUR	1350	15	1	1.2	-0.8	1.4
65602	56.6	-32.7	ALL	P	SUR	1422	28	2	1.3	-0.9	1.6
65662	58.1	-37.4	ALL	P	SUR	387	0	0	1.0	-0.9	1.3
65663	56.4	-40.1	ALL	P	SUR	387	0	0	1.1	-1.1	1.6
997680	46.4	-9.4	ALL	P	SUR	1	0	0	0.0	-2.6	2.6
WIND SPEED											
025026	26.8	-79.3	ALL	SPEED	SUR	1	0	0	0.0	4.6	4.6
098569	27.9	-80.0	ALL	SPEED	SUR	1	0	0	0.0	2.9	2.9
257430	27.7	-80.0	ALL	SPEED	SUR	1	0	0	0.0	4.3	4.3
318919	26.8	-79.5	ALL	SPEED	SUR	1	0	0	0.0	0.5	0.5
325048	26.3	-78.4	ALL	SPEED	SUR	1	0	0	0.0	-2.1	2.1
329381	26.0	-77.8	ALL	SPEED	SUR	1	0	0	0.0	5.6	5.6
358274	27.3	-79.7	ALL	SPEED	SUR	1	0	0	0.0	3.6	3.6
376645	26.9	-79.3	ALL	SPEED	SUR	1	0	0	0.0	-1.0	1.0
406888	27.5	-79.9	ALL	SPEED	SUR	1	0	0	0.0	5.0	5.0
41501	27.0	-77.0	ALL	SPEED	SUR	316	4	1	3.8	4.2	5.7
41502	24.6	-77.7	ALL	SPEED	SUR	80	0	0	2.8	-5.7	6.3
41503	30.6	-76.9	ALL	SPEED	SUR	150	0	0	2.7	1.2	3.0
41504	22.3	-68.9	ALL	SPEED	SUR	119	0	0	2.2	0.5	2.3
41505	25.6	-65.9	ALL	SPEED	SUR	130	0	0	2.4	-4.8	5.4
41523	26.5	-61.1	ALL	SPEED	SUR	333	1	0	2.6	0.6	2.7
41590	19.3	-61.2	ALL	SPEED	SUR	522	0	0	2.5	-6.0	6.5
41594	19.0	-76.1	ALL	SPEED	SUR	217	2	1	3.6	4.2	5.5
41611	15.1	-65.4	ALL	SPEED	SUR	539	0	0	2.4	-0.2	2.4
41616	20.5	-51.9	ALL	SPEED	SUR	543	0	0	2.7	-5.3	5.9
41630	19.0	-64.9	ALL	SPEED	SUR	372	0	0	2.3	-4.8	5.3
41639	18.5	-61.2	ALL	SPEED	SUR	214	2	1	1.9	0.4	2.0
41642	19.9	-64.8	ALL	SPEED	SUR	244	2	1	4.1	1.7	4.4
41644	31.0	-47.8	ALL	SPEED	SUR	11	0	0	1.2	-3.9	4.1
44737	41.8	-60.9	ALL	SPEED	SUR	1	0	0	0.0	-2.1	2.1
44741	59.1	-35.1	ALL	SPEED	SUR	1	0	0	0.0	-0.6	0.6
44743	46.5	-6.1	ALL	SPEED	SUR	1409	3	0	2.7	-1.3	3.0
44772	45.1	-14.4	ALL	SPEED	SUR	1	1	100			
48581	74.9	-75.4	ALL	SPEED	SUR	1	0	0	0.0	10.8	10.8
62506	34.5	-31.5	ALL	SPEED	SUR	624	0	0	2.5	-3.9	4.6
62508	34.8	-13.6	ALL	SPEED	SUR	656	0	0	1.9	-0.8	2.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
62609	57.0	0.0	ALL	SPEED	SUR	1	0	0	0.0	-0.4	0.4
62705	54.9	-12.6	ALL	SPEED	SUR	1	0	0	0.0	-1.5	1.5
62706	57.0	-9.9	ALL	SPEED	SUR	1	0	0	0.0	-2.5	2.5
62709	57.0	0.0	ALL	SPEED	SUR	1	0	0	0.0	1.8	1.8
62823	51.4	-7.9	ALL	SPEED	SUR	1	0	0	0.0	4.0	4.0
856052	27.1	-79.6	ALL	SPEED	SUR	1	0	0	0.0	3.3	3.3
968083	27.8	-79.2	ALL	SPEED	SUR	1	0	0	0.0	0.8	0.8
997680	46.4	-9.4	ALL	SPEED	SUR	1	0	0	0.0	0.5	0.5
WIND DIRECTION											
025026	26.8	-79.3	ALL	DIRN.	SUR	1	0	0	0.0	5.3	5.3
098569	27.9	-80.0	ALL	DIRN.	SUR	1	0	0	0.0	10.3	10.3
318919	26.8	-79.5	ALL	DIRN.	SUR	1	0	0	0.0	7.6	7.6
325048	26.3	-78.4	ALL	DIRN.	SUR	1	0	0	0.0	6.8	6.8
329381	26.0	-77.8	ALL	DIRN.	SUR	1	0	0	0.0	21.5	21.5
358274	27.3	-79.7	ALL	DIRN.	SUR	1	0	0	0.0	-1.0	1.0
376645	26.9	-79.3	ALL	DIRN.	SUR	1	0	0	0.0	4.4	4.4
406888	27.5	-79.9	ALL	DIRN.	SUR	1	0	0	0.0	0.4	0.4
41501	27.0	-77.0	ALL	DIRN.	SUR	230	4	2	15.6	-1.3	15.7
41503	30.6	-76.9	ALL	DIRN.	SUR	94	0	0	23.2	4.9	23.8
41504	22.3	-68.9	ALL	DIRN.	SUR	87	0	0	15.7	4.6	16.4
41523	26.5	-61.1	ALL	DIRN.	SUR	226	1	0	57.3	4.7	57.5
41594	19.0	-76.1	ALL	DIRN.	SUR	82	2	2	32.0	14.0	35.0
41611	15.1	-65.4	ALL	DIRN.	SUR	521	0	0	10.8	11.0	15.4
41630	19.0	-64.9	ALL	DIRN.	SUR	39	0	0	21.9	-9.7	23.9
41639	18.5	-61.2	ALL	DIRN.	SUR	179	2	1	17.7	0.0	17.7
41642	19.9	-64.8	ALL	DIRN.	SUR	219	2	1	14.2	1.9	14.4
44737	41.8	-60.9	ALL	DIRN.	SUR	1	0	0	0.0	-1.1	1.1
44741	59.1	-35.1	ALL	DIRN.	SUR	1	0	0	0.0	-5.5	5.5
44743	46.5	-6.1	ALL	DIRN.	SUR	1081	3	0	20.1	-0.1	20.1
44772	45.1	-14.4	ALL	DIRN.	SUR	1	1	100			
62506	34.5	-31.5	ALL	DIRN.	SUR	360	0	0	15.2	-2.8	15.4
62508	34.8	-13.6	ALL	DIRN.	SUR	520	0	0	16.1	-7.4	17.8
62705	54.9	-12.6	ALL	DIRN.	SUR	1	0	0	0.0	7.9	7.9
62706	57.0	-9.9	ALL	DIRN.	SUR	1	0	0	0.0	19.2	19.2
62709	57.0	0.0	ALL	DIRN.	SUR	1	0	0	0.0	14.4	14.4
62823	51.4	-7.9	ALL	DIRN.	SUR	1	0	0	0.0	58.7	58.7
968083	27.8	-79.2	ALL	DIRN.	SUR	1	0	0	0.0	11.5	11.5
997680	46.4	-9.4	ALL	DIRN.	SUR	1	0	0	0.0	7.7	7.7

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	2815	0	4	1.6	0.1	2793	0	5	0	7.1	0.7
ACA	1387	0	3	1.8	0.0	1385	0	3	0	5.9	0.7
AEA	231	1	4	1.7	0.1	232	1	5	0	9.2	1.8
AEL	303	1	5	2.0	-0.6	300	0	5	0	7.7	1.8
AEY	45	4	7	2.3	1.3	48	0	2	0	8.1	0.8
AFL	259	1	5	2.2	0.3	262	0	6	0	9.2	1.0
AFR	1022	1	6	1.8	0.0	1036	0	6	0	8.2	1.2
AIH	154	1	5	1.8	-0.1	155	0	6	0	8.0	1.6
AJM	97	0	1	1.2	-0.1	98	0	3	0	9.2	0.2
ALM	43	0	7	1.3	0.2	43	2	9	0	5.5	1.8
AMM	62	0	3	1.6	0.1	68	0	4	0	10.4	0.1
AMX	159	2	6	2.2	0.6	163	1	6	0	9.7	0.7
ANZ	173	0	32	1.7	-1.0	171	0	33	0	6.1	0.5
AOM	431	1	2	1.7	0.5	443	1	2	0	7.9	1.8
AVA	210	0	1	2.1	0.6	214	0	2	0	6.8	0.7
AZA	439	1	100	2.9	1.2	447	0	5	0	8.0	0.7
BAL	152	0	9	1.7	-0.4	152	0	9	0	6.0	1.1
BAW	1091	0	5	1.7	0.1	1096	0	6	0	6.5	0.9
BBB	21	0	10	3.2	1.1	21	0	5	0	11.9	-0.4
BLX	26	0	8	1.1	-0.5	27	0	7	0	7.3	2.2
BWA	66	0	9	3.6	3.1	69	1	6	0	9.0	2.5
CDN	107	1	7	1.4	0.1	110	1	9	0	5.9	1.4
CFC	38	0	11	2.1	1.3	40	0	15	0	8.2	0.7
CFG	468	0	3	1.7	-0.9	468	0	4	0	8.2	1.3
CLX	248	0	2	1.5	-0.3	251	0	4	0	7.5	0.7
CMM	98	1	4	1.6	-0.1	96	0	5	0	7.3	1.2
COA	406	1	5	1.8	0.0	410	1	7	0	10.4	1.8
CRL	305	1	6	2.2	0.9	310	1	5	0	8.9	1.8
CTB	31	0	0	0.9	-0.1	33	0	0	0	5.6	1.3
CUB	142	0	4	1.7	0.5	147	0	6	0	9.4	0.6
DAL	940	1	17	1.8	-0.3	960	0	18	0	8.4	1.1
DBY	233	0	1	1.4	-0.2	233	0	3	0	7.8	0.8
DLH	1187	0	5	1.6	0.0	1182	0	6	0	7.4	0.8
EDW	31	3	6	1.2	0.0	31	0	3	0	6.8	1.1
EEZ	31	0	100	3.2	2.3	30	0	3	0	6.6	0.3
ELY	99	0	5	1.7	-0.3	102	2	6	0	7.5	1.4
ETH	33	0	9	1.3	-0.6	33	0	12	0	5.7	0.7
EWW	130	2	6	1.3	0.2	130	1	7	0	6.7	1.2
FDX	820	0	27	1.6	0.2	836	0	28	0	7.8	1.5
FIN	445	0	3	1.5	0.1	431	0	5	0	7.0	0.9
GAF	30	0	0	1.6	-0.5	29	0	0	0	4.4	0.0
GCO	104	0	7	1.6	0.3	113	0	100	0	17.7	6.0
GRL	51	0	0	1.2	0.2	50	0	2	0	7.3	0.1
GTI	117	1	5	2.4	-1.2	117	0	5	0	9.1	1.8
HLF	79	3	5	1.5	-0.8	81	0	5	0	9.3	1.1
IBE	1111	1	4	1.7	0.4	1112	1	6	0	9.7	1.1
ICE	1101	1	2	1.5	0.3	1076	0	3	0	6.4	0.7
JKK	197	0	2	1.6	-0.1	197	0	3	0	7.2	1.6
JMC	82	0	10	2.0	0.7	82	0	12	0	9.3	0.9
KLM	1438	0	7	1.5	0.3	1460	0	7	0	7.0	1.0
LDA	74	0	1	1.4	-0.3	77	0	3	0	7.5	2.2
LDI	357	1	100	1.9	-0.8	354	1	5	0	9.8	1.0
LIB	137	1	4	1.9	1.0	144	1	7	0	10.6	1.7
LOT	186	1	3	1.5	-1.0	181	0	5	0	8.2	0.2
LTU	297	0	4	2.0	-0.3	298	0	4	0	8.2	1.6
MAS	51	0	0	1.6	0.2	51	0	2	0	9.5	1.9
MON	55	0	0	1.2	0.3	54	0	2	0	8.4	1.2
MPD	150	1	5	1.7	0.1	150	0	3	0	6.8	1.6
MPH	536	0	3	1.6	-0.6	541	0	4	0	7.5	0.8

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
NCA	20	0	0	1.4	-0.1	20	0	0	0	4.6	0.1
NVR	22	0	0	1.2	0.1	22	0	0	0	4.2	0.1
NWA	3298	1	2	1.6	0.6	3288	0	2	0	6.3	0.7
PAC	101	1	5	1.5	-0.4	102	0	5	0	7.0	0.7
RAM	50	0	2	1.5	-0.5	51	0	2	0	6.5	1.9
RCH	110	2	6	2.2	0.7	110	1	21	0	15.0	2.5
RJA	28	0	4	1.9	-0.6	28	0	4	0	8.8	-0.3
RRR	30	3	13	1.6	0.2	31	0	10	0	5.7	2.3
RZO	63	0	11	1.6	-0.2	63	0	13	0	10.6	3.3
SIA	79	0	0	1.6	-0.4	79	0	1	0	6.4	0.1
SLR	148	0	9	1.7	0.1	152	0	11	0	7.5	0.6
SVA	71	0	6	1.5	-0.1	72	0	7	0	6.4	1.0
SWR	55	0	4	1.3	0.0	56	0	16	0	12.3	3.9
TAP	206	1	8	2.0	-0.1	208	1	8	0	9.2	1.3
TWA	757	0	6	1.9	0.1	717	0	5	0	8.0	1.0
UAL	1658	0	100	1.6	-0.1	1668	0	100	0	6.7	0.9
UPS	795	0	29	1.6	0.2	806	0	31	0	8.2	0.7
USA	193	3	4	1.3	0.0	163	0	4	0	9.3	1.6
VIR	496	1	2	1.4	-0.2	491	0	3	0	6.6	0.9
VKG	87	0	2	1.2	0.1	87	1	6	0	8.8	0.0
VPB	22	0	0	2.0	1.3	23	0	0	0	6.3	2.0
WOA	83	0	6	1.7	0.8	82	0	6	0	6.4	1.2
EU	16735	0	15	1.2	-0.1	16735	0	14	0	5.2	0.6
KL	3289	0	23	1.4	0.8	3277	0	23	0	5.4	1.1
LH	261	0	8	1.4	0.8	260	0	8	0	4.8	1.2
N	289	2	3	2.1	0.7	292	0	1	0	6.1	1.1
US ACARS	26260	4	33	1.5	0.4	26260	0	26	0	5.2	0.6

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	100	3	0	10.6	22.4	19.7
ELML7	12	Z	100	8	0	19.6	38.4	33.0
FNOR	00	Z	100	5	0	14.3	27.8	23.8
FNOR	12	Z	100	5	0	9.8	25.7	23.8
FNOU	00	Z	100	11	0	13.6	24.1	19.9
FNOU	12	Z	100	10	0	13.1	16.4	9.9
FNPH	00	Z	100	6	0	14.6	32.5	29.0
FNPH	12	Z	100	6	0	20.2	31.5	24.2
FNRS	00	Z	100	7	0	10.1	18.4	15.4
FNRS	12	Z	100	8	0	10.3	11.5	5.1
LDWR	00	Z	100	26	0	10.1	15.4	-11.7
LDWR	12	Z	100	29	0	9.8	14.8	-11.1
OVYA2	00	Z	100	12	1	17.0	17.7	4.8
OVYA2	12	Z	100	9	1	14.8	14.9	1.9
OXTS2	00	Z	100	1	0	0.0	14.0	-14.0
OXTS2	12	Z	100	1	0	0.0	1.0	1.0
OXYH2	00	Z	100	12	0	13.7	13.7	0.5
OXYH2	12	Z	100	9	0	17.7	17.9	-2.7
SWJS	00	Z	100	1	0	0.0	25.0	25.0
SWJS	12	Z	100	2	0	7.5	12.1	9.5
ZCBP6	00	Z	100	5	0	11.8	16.4	11.4
ZCBP6	12	Z	100	5	0	12.7	12.7	-0.2
03953	00	Z	100	29	0	10.6	16.6	12.7
03953	12	Z	100	30	0	11.6	14.3	8.3
04018	00	Z	100	26	0	9.5	12.8	8.6
04018	12	Z	100	30	0	10.6	12.3	6.3
04220	00	Z	100	30	0	12.3	14.4	7.5
04220	12	Z	100	30	0	11.3	11.5	2.1
04270	00	Z	100	30	0	11.7	12.7	-4.9
04270	12	Z	100	30	0	12.9	17.4	-11.6
04339	00	Z	100	29	0	11.4	12.8	6.0
04339	12	Z	100	25	0	13.8	13.9	1.7
04360	00	Z	100	30	0	8.6	10.1	5.2
04360	12	Z	100	30	0	16.2	16.9	-4.8
08001	00	Z	100	23	0	18.8	22.3	-12.0
08001	12	Z	100	26	0	24.9	29.3	-15.5
08508	00	Z	100	26	0	14.6	20.9	15.0
08508	12	Z	100	30	0	15.1	22.0	16.1
08522	12	Z	100	19	0	42.3	42.3	1.1
08594	12	Z	100	23	0	43.0	46.3	17.0
60020	00	Z	100	29	0	18.1	37.5	32.9
60020	12	Z	100	30	0	19.3	34.2	28.2
71600	00	Z	100	29	0	13.6	13.6	-0.2
71600	12	Z	100	29	0	13.4	16.6	-9.9
72201	00	Z	100	27	0	12.5	22.0	18.1
72201	12	Z	100	29	0	12.2	16.8	11.5
72402	00	Z	100	28	0	48.3	59.4	34.7
72402	12	Z	100	31	0	17.6	23.1	14.9
74494	00	Z	100	27	0	18.8	19.8	6.5
74494	12	Z	100	30	0	11.2	15.7	-11.0
78016	00	Z	100	1	0	0.0	34.0	34.0
78016	12	Z	100	30	0	15.6	39.2	35.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
 WMO   OBS               NUM    NUM
IDENT  TIME  ELM   LEV    OBS   GROSS      SD      RMS      BIAS

ELML7   00    Z    500     6      0       7.9      9.9      6.0
ELML7   12    Z    500    12      0      10.4     11.1      3.8
FNOR    00    Z    500     6      0      13.6     20.5     15.3
FNOR    12    Z    500     6      0       9.3     18.7     16.2
FNOU    00    Z    500    12      0      11.0     11.2     -2.1

FNOU    12    Z    500    11      0      13.3     13.6      2.5
FNPH    00    Z    500     6      0       5.1     11.8     10.7
FNPH    12    Z    500     6      0       7.2     11.0      8.3
FNRS    00    Z    500    12      0      10.2     10.8      3.4
FNRS    12    Z    500    11      0      13.3     16.3      9.4

LDWR    00    Z    500    27      0       7.6      8.1     -2.9
LDWR    12    Z    500    29      0       8.0      9.0     -4.2
OVYA2   00    Z    500    15      0      10.9     11.0      1.7
OVYA2   12    Z    500    10      1       9.4      9.8      2.8
OXTS2   00    Z    500     1      0       0.0     22.0    -22.0

OXTS2   12    Z    500     1      0       0.0      3.0      3.0
OXYH2   00    Z    500    14      0      15.5     17.4     -8.0
OXYH2   12    Z    500    10      0      16.0     18.0     -8.2
SWJS    00    Z    500     1      0       0.0      7.0      7.0
SWJS    12    Z    500     2      0       3.5      4.3     -2.5

ZCBP6   00    Z    500     5      0      13.4     13.6     -2.6
ZCBP6   12    Z    500     5      0      14.0     14.0     -0.8
03953   00    Z    500    30      0      13.0     13.1      2.0
03953   12    Z    500    31      0      12.0     15.8     10.3
04018   00    Z    500    29      0       7.9      8.5      3.0

04018   12    Z    500    31      0       8.3      9.6      4.8
04220   00    Z    500    30      0       8.5      9.1      3.3
04220   12    Z    500    30      0       7.9      7.9      0.2
04270   00    Z    500    30      0      11.3     11.3      0.9
04270   12    Z    500    31      0      10.9     10.9      0.4

04339   00    Z    500    29      0       9.6     10.1      3.1
04339   12    Z    500    26      0      11.3     11.9      3.9
04360   00    Z    500    30      0       9.0      9.1      0.8
04360   12    Z    500    30      0      14.6     14.8     -2.8
08001   00    Z    500    27      0      12.5     15.9     -9.8

08001   12    Z    500    28      0      19.5     19.6     -2.4
08508   00    Z    500    26      0      12.9     12.9     -0.3
08508   12    Z    500    30      0      14.7     17.6      9.7
08522   12    Z    500    20      0      11.8     17.4     12.9
08594   12    Z    500    26      0      16.8     16.9     -1.9

60020   00    Z    500    29      0       9.7     14.0     10.0
60020   12    Z    500    30      0       9.3     16.4     13.6
71600   00    Z    500    29      0      15.0     17.5     -9.0
71600   12    Z    500    29      0      15.5     19.0    -11.0
72201   00    Z    500    27      0       6.8      7.5     -3.2

72201   12    Z    500    29      0       8.8     12.5     -8.9
72402   00    Z    500    28      0      16.1     17.1      5.7
72402   12    Z    500    31      0       8.7      8.7      0.3
74494   00    Z    500    29      0      13.0     13.1     -1.9
74494   12    Z    500    30      0       8.0      9.9     -5.8

78016   00    Z    500     1      0       0.0     14.0     14.0
78016   12    Z    500    30      0      13.5     20.4     15.3
```

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	100	1	0	0	5.6	-2.6	-4.9
ELML7	12	V	100	8	0	0	7.4	0.6	2.4
FNOR	00	V	100	5	0	0	3.4	0.8	0.3
FNOR	12	V	100	4	0	0	2.4	0.1	-1.3
FNOU	00	V	100	10	0	0	4.9	-0.1	0.2
FNOU	12	V	100	10	0	0	4.5	-0.3	-0.7
FNPH	00	V	100	3	0	0	3.9	2.7	1.6
FNPH	12	V	100	2	0	0	5.0	-1.8	1.3
FNRS	00	V	100	6	0	0	6.9	0.7	1.4
FNRS	12	V	100	8	0	0	5.4	-1.0	1.1
LDWR	00	V	100	27	0	0	2.5	0.5	0.0
LDWR	12	V	100	29	0	3	4.3	0.3	0.2
OVYA2	00	V	100	10	0	0	3.9	1.4	2.2
OVYA2	12	V	100	8	0	0	5.9	-1.3	0.8
OXTS2	00	V	100	1	0	0	4.2	-1.8	3.8
OXTS2	12	V	100	1	0	0	4.5	1.2	-4.3
OXYH2	00	V	100	6	0	0	5.1	-1.2	-0.7
OXYH2	12	V	100	8	0	0	4.2	-1.0	2.4
SWJS	00	V	100	1	0	0	5.3	-4.4	-3.0
SWJS	12	V	100	2	0	0	11.4	2.2	8.2
ZCBP6	00	V	100	5	0	0	6.4	1.8	2.9
ZCBP6	12	V	100	3	0	0	3.0	-0.7	-2.3
03953	00	V	100	29	0	0	3.6	0.2	0.8
03953	12	V	100	30	0	0	3.0	0.6	0.9
04018	00	V	100	24	0	0	3.3	0.6	0.5
04018	12	V	100	30	0	0	3.2	0.3	0.5
04220	00	V	100	29	0	0	3.5	-0.8	0.1
04220	12	V	100	30	0	0	3.9	0.2	0.1
04270	00	V	100	29	0	0	2.9	-0.5	0.6
04270	12	V	100	29	0	0	3.0	-0.3	0.7
04339	00	V	100	25	0	0	5.3	-0.2	-0.2
04339	12	V	100	22	0	0	5.6	1.4	-1.4
04360	00	V	100	30	0	0	3.7	0.0	-0.2
04360	12	V	100	30	0	0	2.9	-0.2	0.2
08001	00	V	100	22	0	0	4.9	0.6	0.2
08001	12	V	100	25	0	0	4.6	-0.2	0.2
08508	00	V	100	13	0	0	5.8	1.8	0.9
08508	12	V	100	19	0	0	4.5	0.7	-0.4
08522	12	V	100	17	0	0	5.3	-1.9	0.5
08594	12	V	100	23	0	100	6.1	-0.3	2.2
60020	00	V	100	28	0	0	6.2	2.4	-1.7
60020	12	V	100	30	0	0	4.8	-1.6	0.8
71600	00	V	100	29	0	0	4.6	1.1	-0.6
71600	12	V	100	29	0	0	5.8	1.1	0.8
72201	00	V	100	27	0	0	4.8	1.9	-0.1
72201	12	V	100	29	0	0	4.8	-0.7	0.0
72402	00	V	100	27	0	0	6.2	0.8	1.6
72402	12	V	100	31	0	0	6.2	1.3	0.5
74494	00	V	100	24	0	0	4.3	-0.3	0.9
74494	12	V	100	26	0	0	3.4	-0.7	0.2
78016	00	V	100	1	0	0	2.2	-2.0	-0.8
78016	12	V	100	27	0	0	5.5	1.7	-1.0

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: DECEMBER 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	500	6	0	0	3.8	-0.6	-0.2
ELML7	12	V	500	10	0	0	5.8	0.2	-1.5
FNOR	00	V	500	6	0	0	5.5	-3.5	-0.4
FNOR	12	V	500	5	0	0	4.0	-0.4	-0.4
FNOU	00	V	500	11	0	0	4.4	-1.3	-0.9
FNOU	12	V	500	10	0	0	5.1	-3.0	1.0
FNPH	00	V	500	3	0	0	3.7	-0.9	1.0
FNPH	12	V	500	2	0	0	3.4	-0.4	2.0
FNRS	00	V	500	7	0	0	2.5	-0.5	0.1
FNRS	12	V	500	7	0	0	3.7	0.7	-0.9
LDWR	00	V	500	27	0	0	3.9	-0.4	0.5
LDWR	12	V	500	29	0	3	6.5	-1.2	0.3
OVYA2	00	V	500	13	0	0	5.0	-0.4	0.7
OVYA2	12	V	500	9	0	0	5.2	0.0	-0.5
OXTS2	00	V	500	1	0	0	5.5	-5.2	-1.9
OXTS2	12	V	500	1	0	0	1.6	0.4	-1.6
OXYH2	00	V	500	9	0	0	4.7	-1.1	-0.6
OXYH2	12	V	500	7	0	0	4.1	1.5	1.3
SWJS	00	V	500	1	0	0	4.2	2.8	-3.1
SWJS	12	V	500	2	0	0	8.9	4.9	-2.5
ZCBP6	00	V	500	3	0	0	6.5	4.5	2.5
ZCBP6	12	V	500	3	0	0	3.8	1.5	-0.9
03953	00	V	500	30	0	0	4.9	-0.2	0.0
03953	12	V	500	31	0	0	5.5	1.3	-1.0
04018	00	V	500	29	0	0	4.2	-0.5	0.4
04018	12	V	500	31	0	0	4.3	0.6	-0.3
04220	00	V	500	30	0	0	5.8	-1.1	1.5
04220	12	V	500	29	0	3	6.3	0.8	0.8
04270	00	V	500	30	0	0	4.4	-1.0	0.0
04270	12	V	500	29	0	0	4.3	-0.2	-0.2
04339	00	V	500	28	0	0	6.0	0.4	-0.4
04339	12	V	500	26	0	0	5.7	0.1	-1.4
04360	00	V	500	30	0	0	4.0	0.1	-0.4
04360	12	V	500	30	0	0	4.1	-1.4	0.6
08001	00	V	500	27	0	0	6.4	1.7	0.3
08001	12	V	500	27	0	0	6.1	0.0	0.0
08508	00	V	500	14	0	0	4.3	0.9	-0.4
08508	12	V	500	22	0	0	6.2	2.1	0.5
08522	12	V	500	20	0	0	5.1	0.9	0.0
08594	12	V	500	27	0	100	4.9	0.1	-0.8
60020	00	V	500	27	0	0	5.4	-1.9	-0.7
60020	12	V	500	28	0	0	4.1	-0.5	-0.6
71600	00	V	500	29	0	3	6.8	-0.1	0.3
71600	12	V	500	29	0	0	5.6	-0.3	0.4
72201	00	V	500	27	0	0	4.2	0.0	-0.1
72201	12	V	500	29	0	0	4.1	-0.5	-0.3
72402	00	V	500	27	0	0	3.2	0.5	-0.4
72402	12	V	500	31	0	0	4.1	0.4	0.4
74494	00	V	500	28	0	0	4.2	-1.3	1.3
74494	12	V	500	30	0	0	4.6	-1.1	0.4
78016	00	V	500	1	0	0	1.7	-1.5	0.9
78016	12	V	500	30	0	0	5.4	0.0	1.9

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45